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SEVENTH ANNUAL SESSION

OF THE

INDIANA

STATE HORTICULTURAL SOCIETY,

HELD AT

INDIANAPOLIS, JANUARY 7th, 8th and 9th, 1868,

INCLUDING A REPORT OF A

CALLED MEETING, HELD AT SALEM,

August 13th and 14th, 1867,

AND

REPORTS OF AD INTERIM AND SPECIAL COMMITTEES, LOCAL SOCIETIES, ETC., ETC.

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1868.

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CONSTITUTION

OF THE

INDIANA HORTICULTURAL SOCIETY.

1. This Society shall be known as the "INDIANA HORTICULTURAL SOCIETY."

2. Its officers shall consist of a President, four Vice Presidents, a Recording Secretary, a Corresponding Secretary, and Treasurer.

3. The President shall preside at and conduct all meetings of the Society, and in his absence the Vice Presidents, in their order, shall perform the same duties.

4. The Recording Secretary shall record all the doings of the Society, collate and prepare all communications, etc., for the public press, and pay over all money received from members, or otherwise, to the Treasurer, on his receipt.

5. The Corresponding Secretary shall receive and answer all communications addressed to the Society; establish and maintain correspondence with all Local, County, and District Horticultural Societies, and all kindred State Societies, and secure, by exchange, their Transactions, as far as possible; to aid the President as an executive officer in the dispatch of business relating to the meetings of the Society—preparing and publishing circulars of the Society, and notices of Horticultural and similar meetings of general interest; and report to the annual meeting of this Society an abstract of the matter that has come into his possession, which, with its approval, shall become, in the hands of the Recording Secretary, a part of the Transactions of the current year.

6. The Treasurer shall collect and hold all funds of the Society, and pay out the same only on an order from the Secretary, countersigned by the President.

7. The officers shall be elected separately and biennally, by a ballot vote, and hold their office until their successors are elected.

8. The object of the Society being to collect, condense, and collate information relative to all varieties of fruit, and dispense the same among the people, every member shall pay into the treasury $1 00 a year, for the purpose of publishing, and other expenses. And any person interested in fruits, may become a member by forwarding to the Treasurer or Secretary the membership fee.

9. Every member shall be entitled to a copy of the Transactions of the Society, as often as the same shall be published by order of the Society.

10. The President and Secretary of the Society may call a meeting of the Society, at any time and place they may consider advisable, by a notice of thirty days in the public papers.

11. The President, at each annul meeting of the Society, shall appoint a General Fruit Committee, consisting of two members residing north of the National Road and two south of said Road, to which the President shall be added as Chairman; and it shall be the duty of said Committee to submit an annual report of the fruit crop throughout the State. And it shall be the duty of said Committee to report annually a limited list of fruits best adapted to general cultivation for the State at large, and also lists adapted for cultivation north and south of the National Road.

12. By-Laws and alterations in the Constitution, for the purpose of governing further wants of the Society, may be enacted by a majority of the members present at a regular meeting.

13. The Society shall hold annual sessions in the city of Indianapolis, on the first Tuesday after the first Monday in January; a semi-annual session in June, the particular date and place to be selected by the Committee *ad interim*, and other meetings at such times and places as the Society may direct.

PROCEEDINGS

OF THE

SEVENTH ANNUAL SESSION

OF THE

INDIANA HORTICULTURAL SOCIETY.

FIRST DAY.

The Seventh Annual Session of the Indiana Horticultural Society met in the Senate Chamber at the State House, in the city of Indianapolis, January 7, 1868, at 10 o'clock A. M., and was called to order by the President.

On motion of C. Fletcher, a committee of three was appointed on business. Committee—C. Fletcher, S. W. Pearson and Dr. Furnas.

The Treasurer made the following report, which was adopted:

INDIANAPOLIS, January 8, 1868.

To the President and Members of the Indiana State Horticultural Society:

RECEIPTS.

Received for Membership	$147 00
Received from sale of Reports	2 00
Received from Reports sold	3 00
Received from Advertising	58 00
Received from Nelson	5 00
Total	$215 00

DISBURSEMENTS.

Paid for Rent	$12 00
Paid Fletcher, Old Treasurer	7 00
Paid Secretary for services, time and expenses in getting out Reports for 1867	86 05
Paid Gilbert, Corresponding Secretary	24 40
Paid Postage	24 00
Cash on hand	61 55
Total	$215 00

J. S. DUNLOP, Treasure

Interesting letters were read by the President from Chas. Downing, F. R. Elliott and others.

On motion of C. Fletcher, the following resolutions were unanimously adopted:

1st. That the pleasant association and co-operation of this Society with that of the State Agricultural Society during the past year, through both the delegate and State Boards, is gratefully remembered.

2d. That as a token of our esteem, we provide each member of said Boards with a bound copy of our printed proceedings for the past year.

3d. That the respective interests of the two Societies do not, and never should conflict, but that their relative positions are properly recognized, and should ever be in harmony.

The foregoing was courteously responded to by furnishing each member of this Society with a copy of the Agricultural Reports for the past year.

Adjourned to 2 o'clock P M.

AFTERNOON SESSION—FIRST DAY.

An address was delivered by Dr. J. A. Warder, of Cincinnati, on the grape vine and its peculiarities.

He said the important parts of the vine were the *shoot* and its *laterals*, the *cane*, and the *stem*. Under the first he would include only the annual extension of the vine during the season of its growth, and while clothed with foliage—say for the first five or six months of its existence. Such growths are *shoots;* they present the same peculiarities, and have the same interesting appendages. While young they are very easily separated from the older wood, from which they spring, and may be rubbed out or broken off with a very slight effort—a great advantage to the vine-dresser, who may thus very easily curb the redundant wood-growth at the early part of the season, and direct the sap into what he leaves behind.

The process called rubbing out is generally effected with the thumb and finger, removing the redundant growth while it is yet quite small, and thus leaving the shoots at a sufficient distance apart to prevent crowding.

The shoots all spring from the buds of a previous year's production, the fruitful ones almost universally from the buds formed in the last season, hence the bearing wood, as it is called, must always be new, or only one year old. Shoots may come out from the older parts of the vine, however, and such, when they spring from the lower part of the stock, are often called water-shoots, and are always barren. These are generally rubbed out soon after they appear, though it is recommended always to preserve one such on each vine, but to keep it in a subordinated condition; it may be very valuable as a starting point from which to renew the vine when it may at any time become injured by frost or otherwise, or when from long continued bad pruning or mismanagement it has become misshapen and unfruitful.

Shoots have appendages—they are furnished with *leaves*, *buds*, *laterals*, *tendrils*, and *bunches* of fruit. The leaves appear on alternate sides of the shoot, and are arranged in a definite order, according to the phyllotaxy of the vine. At the base, or in the axil of each leaf, a bud is produced, and upon the healthy development of this important organ will depend the future productiveness and development of the vines. These buds may be considered the individual plants of which the complex one is composed; from them will proceed all future growth by extension; within their folds lie enwrapped the promise of fruitfulness for the coming year; their proper development is therefore of the utmost consequence to successful grape growing. That they are really individual plants, is proved by the propagator, who takes them separately, and produces independent plants.

In a vigorous shoot the abrupt termination of its extending growth, either by accidental fracture, or by the cutting or pinching of the vinedresser, or even by its depending position in which it is allowed to hang point downwards, the extreme vigor will often cause so great a development of their buds, that they will burst out into growth, side shoots will be produced, and these are called *laterals*.

The *lateral*, therefore, is but a subordinate *shoot* during the season of growth, the branch of a shoot; and if allowed to remain upon the vine after the winter pruning, it is equally a branch of the *cane*. It is found to play a very important *role* in vine culture, and as *laterals* are very frequently referred to in discussions upon pruning, it is very necessary that we should understand the precise meaning of the term, that we may avoid the misapplication, which is often heard.

The portion of the shoot between the buds is called the *internode;* it never produces buds, but will emit roots at any point.

Tendrils and Bunches.—On the side opposite to a leaf we find a peculiar appendage, by which support is gained to sustain the tender shoot; this is the tendril; at first soft and green, it reaches out into the air as though seeking some object about which to entwine its loving arms, and no sooner is it brought in contact with such a support than it clasps it around with a firm grasp, making a spiral, and immediately it becomes firm and woody. The attachment of this organ with the shoot from which it springs is very firm, and its connection continues for a long time after the circulation of sap has ceased, whereas the leaves fall at the close of the season of growth, and often before that time.

Under the influence of a curious morphological change, the tendril becomes more branched, germs are developed at the ends of subdivision, buds, flowers, and fruit, with seeds, are produced, and the barren tendril, which was merely an organ of support, becomes the fruitful *cluster* or *bunch*, and is laden with its luscious grapes. For man's convenience the bunch has a joint where it is easily separated from the vine.

The position of these tendrils, and the number of bunches that may be produced on any shoot, is an interesting and curious matter of investigation. Dr. Mohr, a distinguished German author, a portion of whose writings have been translated by Mr. Siedhoff, of New Jersey, and published under the title of "The Grape Vine," has studied this subject, and gives the result of his observations on the European vine. He states that the tendrils or bunches always occur opposite to two successive leaves, but never at the third. Extended observation on American varieties has shown that this law does not apply to them, but that though there may be leaves upon the shoots that do not have the tendrils opposite to them, their appearance in consecutive order is often continued to the number of fifteen, twenty, and even twenty-three tendrils opposite to as many leaves without interruption.

The number of these tendrils which may possibly be changed into bunches is variable, and appears to depend upon the peculiar habit of the variety, or upon the condition and vigor of the individual vine. Two, three, and even four bunches are often seen upon a fruit-bearing shoot, but the outer bunches are often small, and their removal early in the season is usually advised by vinedressers to favor the fuller development of one or two bunches that are left.

During the summer, the season of growth, the shoot develops itself with its appendage of leaves, tendrils, and bunches; sometimes the former are developed into other side shoots or *laterals*, but at the fall of the leaf, its existence as a shoot ceases abruptly, for it has become woody, and its connection with the older portions of the vine has grown firm and intimate by the continuity of the woody fibre; thus the shoot can never be more than five or six months old, for then it becomes a *cane*.

The organ is covered by one layer of thin bark, and is furnished with the permanent appendage of the shoot, the tendrils, buds, the lateral canes, and their buds—from the buds are to proceed in the coming year the growth of the vine in a new crop of shoots—during which period of one year only can the part be called the *cane*, for after that it becomes a *stem*. The expression *cane* is often applied erroneously to those shoots which are grown especially for fruiting wood in the common renewal system of training where the vine is pruned to a cane and spur, from the latter of which it is designed to produce the new wood for the future cane; during the first summer, such shoots should be called *cane shoots*, in contradistinction to fruiting shoots, for they do not become canes until the close of the growing season.

At the maturity of the fruit and foliage at the close of the Autumn, all the wood growth that has seen two summers, is classed as a portion of the *stem* of the vine, whether this be in the main stock or in its permanent branches, called arms. The *stem* is characterized by having thicker and darker bark, the outer layers of which hang loosely upon it, and are stripped off. As before observed, stems may produce shoots that issue from dormant buds, but these shoots can only be fruitful under favorable circumstances; they are generally barren, but by proper management, the canes resulting from them may be made productive the next year.

Having familiarized ourselves with these terms, and their precise meaning and proper application, let us hope that in our future discussions we may have less confusion in the use of the language we employ, and consequently a much clearer and more exact appreciation and understanding of the lessons we receive, or of the instruction we may attempt to impart.

To recapitulate: The shoots and leaves exist only during the season of growth; the laterals originate from the buds of the shoots, and are at first lateral shoots; but if left, they become lateral canes. At the fall of the leaf, the shoots become canes, and continue to bear this title for one year, after which the wood is all called stem, whether it be in the stock, arms or spurs of the vine.

This short and useful lecture upon the use of terms was followed by a discussion among the members, which developed many interesting and valuable ideas that had been discovered in their experiences and observations upon the vine.

Dr. Brown said, if he was to leave but a single bud, he would not take the first at the base of the cane, for we do not get to a maximum till the fourth bud; therefore he would take the fourth, fifth and sixth buds—the first second and third frequently producing no fruit. This was the cause of some varieties producing no fruit when closely pruned. Said he could get better grapes from canes twenty feet from the root than from those near the root. Grapes on the end of the vine, or far from the root, are not so liable to rot. Spoke of the soil for grapes. Said the Fox Grape, and derivations of it, naturally grow on a clay soil. Had seen the Isabella do well on stiff, wet clay soil—so wet that garden vegetables did not do well—while the Mountain Blue Grape, and those derived from it, delight in a light, porous, rotten, rich soil. Said he was satisfied we should have to fall back on the grape, as the peach crop had proved a failure.

M. L. Dunlop, of Champaigne, Illinois, said he had been interested; that we should throw aside all the grape literature and study grape culture, and it could all be told on two pages of foolscap, for it is simple and easy to understand. It is time this subject was divested of the mystery that had been thrown around it; thus every farmer, or farmer's daughter, could raise grapes. He spoke of the difference in the quality of the grapes grown on Lake Michigan and those on the Ohio River; those in the latter situation had more solidity and firmness, and consequently better for wine.

Dr. Bland, of Indianapolis, spoke of the different works on the grape, and fully united with the views of Mr. Dunlop.

D. V. Culley, of Indianapolis, said he trained his vines on stakes seven or eight feet high, with a crosspiece three or four feet long nailed on the top, and another the same length eighteen inches below. Let the vine hang over these like an umbrella. The air can circulate freely, and the sun can reach them better. He recommended hilling up around the vine with dirt or coal ashes. Thought the ashes excellent for the health and vigor of the vine.

The President said that the culture of the grape had been so mystified that people had been deterred from trying to raise grapes. His mode had been simple, and he had good grapes. He believed we were on the right track now.

Dr. Warder spoke of the grapes of Kelly's Island. They had a magnificent crop. The dry season had matured them better than usual. Spoke of the manner of packing the box up side down, filling it so that when the bottom was nailed on, it pressed them in. It improved their appearance when the branded side was opened, nothing but grapes, no stems, appear, and all are even. Said the same would hold good in packing apples and pears, to pack them with the barrels up side down, and press them in, so that when opened they are smooth and nice.

J. Mason, of Waverly, said grapes were often pulled too soon, before they were fully matured. Thought they were greatly improved in flavor by hanging on the vine.

On motion of Wm. Patrick, of Terre Haute, a vote of thanks was tendered Dr. Warder for his interesting address.

Adjourned till 7 o'clock this evening.

EVENING SESSION—FIRST DAY.

On motion of Wm. Patrick, of Terre Haute, a committee of six was appointed to consider a change in the form of a fruit list. Committee—I. D. G. Nelson, I. Jessup, W. H. Ragan, Dr. Furnas, M. D. Bowman and J. C. Shoemaker.

The subject of Winter Apples was taken up.

Dr. Warder said there was a great deal in the time fruit was picked to insure keeping well. If picked early and kept in a cool place, it will be preserved much longer.

Considerable discussion ensued. The Ben Davis apple was spoken highly of by the President and some others, while some had not heard so good reports; but in some districts it had shown signs of rotting on the tree.

Dr. Brown said, in order to keep an apple well, you must pick before it is fully matured, and keep it cool, below 40 degrees; an apple would not freeze at 32 degrees; a sweet apple would not freeze at 25 degrees. Said they kept best when the light was entirely excluded.

M. L. Dunlop, of Illinois, said they kept best in the ground; thought an even temperature requisite. Said they could be kept in straw if you let the thermometer be down to 34 degrees, and cover three feet deep.

R. S. Ragan, of Greencastle, said that was just the thing, if you can hold an apple in a regular temperature and just above the freezing point. When an apple begins to mellow, the particles begin to give way, and it begins to decay. Spoke of Rawl's Janet as the best apple. *It is the nearest gold of any other apple in Central and Southern Indiana, Kentucky and Tennessee.* Put them in a box and pour dry sand in till full; then put them away. They make the best June apple in the world. He said that the Roman Stem was an excellent apple, tree very hardy and productive; which opinion was concurred in by several members.

Alfred Hadley, of Parke county, said he was glad to hear the Roman Stem spoken so well of. He had trees twenty years old. The tree was hardy, a good bearer, and the apple of the best quality.

Dr. Furnas was of opinion that they were a little tricky, and that they scab badly in some localities.

M. L. Dunlop, of Illinois, said that the Roman Stem gave entire satisfaction. The tree was hardy and the fruit very good; but it was not large and showy enough. People generally eat with their eyes instead of their taste.

J. A. Mendenhall, of Richmond, said they were too small for profit, and that the same could be said of Rawl's Janet.

R. S. Ragan spoke of an orchard of sixty trees, that he had known for years, composed of Ragan's Red, Vandever Pippin, Belleflower, and Janet; and that a tree of the Janet doubled a tree of any other kind, taking one year with another. It is the "Wilson Albany" among apples. When they are mellow they are always good.

C. Fletcher said that he had been thinking a good deal to-night. The commercial value of fruit had been manifested this season. He had been situated so that he could see the hundreds of wagon loads going to market. There were ten thousand barrels shipped to Cincinnati in one day. We are beginning to look at this matter in its true light. He was glad to see men were beginning to taste the fruit of their labor. There is no State of the same size in the Union that can furnish so many acres of apple growing ground.

Lewis Jones asked if any one had tried the King of Tompkins County, relative to shriveling. Said he had laid up a number of specimens in a dry place. All shriveled except this, which was plump and nice.

The President said that in the northern part of the State it did not succeed.

Committee on Fruit on Exhibition.—Calvin Fletcher, William Patrick and Dr. A. Furnas.

Committee on Wine and Canned Fruits.—M. L. Dunlop, Dr. Warder and Dr. Bland.

Adjourned to 9 o'clock A. M. to-morrow.

MORNING SESSION—SECOND DAY.

Wm. H. Ragan, of Fillmore, read a paper prepared by Dr. Wm. Matthews, of Mason, Effingham county, Illinois.

IS THE CULTIVATION OF FRUIT DESTINED TO REMAIN A PERMANENTLY PROFITABLE BUSINESS?—BY W. MATTHEWS, M. D., MASON, ILLINOIS.

Though it may be impossible to give a perfectly satisfactory answer to this question, yet it is one deserving some consideration, in as much as its solution concerns both the public generally, and the cultivators of fruit particularly. For it must be apparent to all, that in a pecuniary, or perhaps more properly speaking, mercenary point of view, the interest of these two classes is antagonistic. While it is to the interest of the public—who are the buyers—to have the various markets glutted, so to speak, with fruits, continually from years' end to years' end, it is clearly the interest—though a sordid one, it must be confessed—of the cultivators thereof to send their products only to places where they are in active demand at remunerative prices.

Not only is such a state of things true as regards fruits, but it is equally true in relation to the ordinary products of the farm. It is sometimes possible to overstock our grain markets; that is, it sometimes happens, under a combination of favoring circumstances, that there is more grain produced than is absolutely necessary to supply the demands of consumers, the result whereof is, that prices fall off so much as to leave but little or no margin for the farmer. When this occurs, which by the way, it is to be regretted does not occur more frequently, while the producers are apt to complain, the consumers, other things being equal, have cause to rejoice. Now in a perfectly well-regulated community this thing of a needless surplus does not often happen; because no more persons should be engaged in producing grain than are barely necessary to subserve the demand, at such prices as shall be but just to both parties—producers and consumers. Excessive production begets low prices, and low prices, in whatever department of industry, tend to lessen the aggregate amount produced, by driving labor from that particular business into other occupations, which it is imagined at least, promises higher profits. For example: Suppose that nine-tenths of the farmers of the great corn producing districts of the United States were to conclude next season to put forth nearly their entire energies in an effort to produce an immense crop of that grain, to the neglect of other ordinary products of their soil. The consequence would most likely be an excess of this one grain, and therefore a ruinous reduction in the price thereof.

Another consequence of the excessive corn crop here supposed, and the necessarily low price of it, would be to drive laborers from its cultivation, to seek other more promising fields of industry. Probably many of them would turn their attention to wheat growing, since it would be but fair to infer that by the neglect of this crop, its price would range high. And indeed, a state of things nearly precisely analagous to the case here supposed is almost constantly transpiring. So that a very full crop of any of the great leading productions of our soil, extending over a large district of country, presupposes a light crop the succeeding year, and *vice versa.* It has been truthfully said that men are but children of larger growth. The boy who catches the most and largest fish, is very sure to find himself and his particular pool quickly surrounded by swarms of eager companions. In like manner, the man who strikes a rich lead in the gold mines of California, is not apt to be alone long. Corn goes well this year—next year every one who has a spare rood of land will be tempted to cultivate it in corn.

These statements are but unvarnished facts as far as Agriculture is concerned. A light crop and high prices of this or that ordinary farm product, is almost certain to stimulate the producers of the given article to extra exertions the next season; and not only so, but the existence of such a fact usually brings thousands of others into the same field of labor.

Now, what is true as regards Agriculture is equally true when applied to Horticulture, including of course, Fruit culture, or perhaps more properly speaking, Pomology. Nay, since the consumers of fruit are in less proportion to the area of country adapted to its culture, than are consumers of grain to the grain districts, it is only fair to conclude that it is possible more readily to overstock the fruit than it is the grain market. Hitherto the price of fruit has usually ranged so high as to necessarily preclude the poor from buying and paying for it. As regards some particular kinds of fruit, however, the past season has afforded a partial exception to this rule. Strawberries and grapes, for example, were so abundant in many of the leading markets last year as to command prices unprecedently low. So low indeed, were these two species of fruit as scarcely to compensate in many instances, their producers, much less to yield them those enormous profits which many of them had been led to expect.

Why let us ask, was this so? What explanation can we offer to satisfactorily account for it? There need be no difficulty, I think, to answer these questions correctly. The reason for the excess and consequent low price is obvious.

Only a few years ago the cultivation of strawberries for market purposes was unknown in the West. The first business of the kind which amounted to anything worth reckoning in the West, was commenced in the memory of perhaps every one present, at Cincinnati. But I believe in consequence of the sparcity of the yield of the plants then in use, the business was not found to be very profitable, and the number of persons engaged in it was not until long afterward, very considerable. About this time however, the Wilson Albany Seedling was introduced, and now a new era in the cultivation of the Strawberry began. With this plant it was found that with moderate culture, one hundred bushels of berries might be produced on an acre of ground. Thus an acre of land, it was found, would produce an amount of berries worth from perhaps five to eight hundred dollars, the whole expense of raising and marketing which need not exceed the one-sixth of that amount. For several years however, this fact was not patent to the masses. Nor was it the interest of those engaged in this lucrative business to let the "cat out of the bag." The fewer competitors they had the better was it for them. It is true, that we occasionally heard that such and such individuals were making a nice thing out of Strawberries; but in short, the public generally did not fully appreciate the fact until the very cream had been well nigh all taken out of the business. This was I freely confess, the case with me. I was not aware of the exceedingly profitableness of the Strawberry business until its great profits were nearly destroyed by competition.

I propose here giving a synopsis of my own experience in that matter, not doubting that it will tally with that of many of my co-laborers. Having satisfied myself that, when properly managed, some money might be made by the cultivation of Strawberries, I determined to set a patch of about four acres in the spring of 1865. This I accordingly did here where I reside, at Mason, Illinois, on the Chicago branch of the Illinois Central railroad, two hundred and twelve miles south from Chicago. Before I did anything however, I visited Mr. E. Sims' place, some thirty or forty miles still south of me, for the purpose of picking up whatever information of a practical character I could touching the contemplated enterprise. Mr. Sims is an extensive and very successful cultivator of the Wilson berry in this State, and withal, is an intelligent and a very clever gentleman. Without reserve, he told me what he had done and was doing, and assured me that in his opinion, I need entertain no fears as to the possibility of the market ever becoming so stocked as to reduce prices to unreasonably low figures. I thought differently, but did not attempt to argue the question with him. He freely told one of the fabulous profits he had made and was making with Strawberries. These statements encouraged me to enter upon the business; they also encouraged others, and here in the State of Illinois alone, thousands upon thousands of acres were speedily set with Strawberry plants —nearly all of the Wilson variety. The result was natural enough, and need not to have surprised any one. Though the last season only a partial crop was had, for several weeks the Fruit Train on the Illinois Central was daily loaded down with berries, all headed for Chicago; and I may add, the mail train going south, brought us back, daily, the returns from our commission merchants, ranging all the way from one cent to twenty-five cents per quart—less expenses, and this latter item was, you may readily believe not a very small one.

This is but a succint history of the experience of one man in a business, which because it had been largely remunerative, it was inferred by many would so continue to be. I do not conceal the fact that even in my case the culture of Strawberries has paid me better than the same amount of labor expended upon them would have yielded me had it been expended in the cultivation of corn or wheat. Nor do I regret in the least the result of the trial which I have given the business. On the contrary, it is my fixed purpose to continue the business permanently, under the idea that it will in the end prove reasonably compensating. The fact that little was only made the last season by many of the cultivators of this fruit, while many more have actually lost by it, are encouraging facts to my mind, calculated to increase my efforts next season. Thousands now engaged in the cultivation of this berry will abandon the business, because they will think they can see better promise of returns in some other employments, while other thousands, hearing of the comparatively low prices of last year, will be deterred from going into it.

This fruit business as in nearly every thing else connected with our commercial relations, will inevitably find its proper level. The supply will keep pace with the demand. When the demand is very active and prices run high, excesses will be apt to be thrown upon the markets; and thus prices will be reduced. It is to be hoped therefore, then in the fruit business no more persons will engage than are sufficient to supply the markets with their products at barely remunerative figures.

When more than this number do engage in it, prices, other things being equal, will surely range low, but this circumstance will certainly tend to lop off some of those thus engaged and in this manner, the equallibrium will be restored. In like manner, high prices—more to be regretted than low prices—will unquestionably induce new laborers to rush into the business, and thus the equilibrium will be again returned, this time however, in an opposite direction.

In those remarks I have confined myself chiefly to the single fruit of Strawberries. I have adopted this course more easily to illustrate my subject than for the purpose of singling out any one particular fruit or berry which might be more obnoxious to the objections or fluctuations of price than others are. Nevertheless it is a fact, that for obvious reasons, which will suggest themselves, it is an easier matter to clog and glut the markets with this fruit than with almost any other single one. But even in the case of Apples and Pears, much more in that of Peaches, the markets may by abundant supply, occasionally become so overstocked as to bring prices down so low as to leave little or no margin for the profits of the producers. Yet this state of things is not likely to recur often. It costs but little to produce these fruits, which, when it is remembered how frequently they fail, and in what a multiplicity of ways they may be handled, and the great length of their seasons, will almost preclude the possibility of ever permanently overstocking the market with them.

Let us in conclusion, briefly recapitulate this, by no means uninteresting subject. Contrary to the opinion for several years past so commonly promulgated by many of the leading Pomologists of the country, I assume that it is possible to so overstock the markets with fruits as to reduce prices to figures bare compensatory. This has I conclude, actually been done in the case of Strawberries and perhaps some other fruits. When this state of things occurs however, I argue that the supply will quickly right it, and that one is just as much warranted in now entering upon the cultivation of fruit for market purposes as he would be in entering upon the cultivation of corn and wheat, or the rearing of hogs, cattle or horses for a like purpose. It will occasionally transpire no doubt, that his crop will not fully compensate him for his labor and expenditures; but the same thing continually occurs with the farmer. Prices, like the face of the sea are not entirely tranquil. The gentlest breath is liable to disturb them. A gale from the north not unfrequently nips the blossoms in the buds over large districts of country, and thus both destroys hopes and builds up comparative fortunes. For my own part, I do heartily trust that the time is not far distant when fruits peculiar to our climate may be so plenty and the prices thereof so low, that even the poorest of the poor may have and enjoy them. It was declared long since as one of the wonders attending the Christian epoch that "the poor have the gospel preached unto them." Now although it is a lamentable fact that chiefly through the sordid priesthood, this promise has never been fulfilled and never will be until religionists exhibit less selfishness and more charity than is at present manifest, let us not be so mean as to deny to them the physical blessing of fruit in abundance. Not only so, but let us also do whatever we may to encourage every one of them who has an acre of ground, to plant and cultivate some fruit. Thus we ourselves shall be thrice blessed, for we shall be gratefully remembered of them, and of their children, and of God himself, as benefactors of our fallen race. And in the meantime, without giving even a serious thought as to the morrow, let us go on ourselves in the business in which we are engaged with the glorious motto continually before our eyes: "He that holds out faithful to the end shall be rewarded."

The following paper on Cider Making was read by W. H. Ragan, of Fillmore:

CIDER AND CIDER MAKING—BY W. H. RAGAN.

To the President and Members of Indiana Horticultural Society:

Our present large crops of Apples, and the interest now manifested by the people in tree planting, being unparalleled in zeal and earnestness, leads the timid among us to enquire what are the future prospects for market for our large surplus.

Will it pay, in the future to raise Apples for market? In other words will the demand keep pace with the supply?

I answer that it will not, if we expect to put our fruit on the market as we now do—in that unwarrantably bad condition that is so common—for then the price will range so low that orchardists cannot realize a sufficient amount for their trouble, not so much perhaps as if their ground was cultivated in grain or potatoes. But say you, our fruit is becoming so defective, that to throw out all that really should be discarded, is too great a waste. If you can tell us how to make this part of our Apple crop profitable, we can then afford to give our fruit for market more careful handling? This is just what we will try to do in this paper, for in the opinion of the writer, the profit of the Apple Orchard, is in what might be termed the *offal.*

One third of the fruit from orchards of cultivated varieties, well selected, and carefully packed in clean barrels, will sell for as much as the whole crop will usually bring when put up *en masse*, and offered for sale, as is the present practice with those who have apples for sale. This leaves in the hands of the producer two-thirds of his crop, in bulk, that has cost him nothing—less than nothing if the extra expense of barrels and handling is counted out, which when made into Cider or Vinegar, pays a large profit on mauufacture.

But making Cider with our present facilities, is a laborious process, and selling it for a paying price is a still greater "trick," is the way most of our farmers reason, and hence they try to force their whole crop of fruit into market.

We find however this prevailing opinion to the contrary notwithstanding, that it is very little trouble to make Cider, and when properly made, still less to sell it, and that too at remunerative prices.

The difficulty that men experience in selling Cider, generally arises from the same causes that are in the way of the sale of Apples, that is from bad handling, and a desire on the part of the producers to have what little is good, to sell all their *bad.*

Those acquainted with the manufacture of wines, understand the utter impossibility of making good wine in a filthy, slovenly manner, even though the grapes be of the best varieties and thoroughly ripened. Just so it is with Cider. It is just as susceptible of injury from contact with anything offensive as wine. I now have a barrel of Cider on hand, that has been rendered entirely unfit for use by the mere accident of spilling some Petroleum on the head of the barrel, although not a particle of the oil entered the bung-hole. How important then, that we should observe the strictest cleanliness in all our handling, as well as in the selection of vessels for its reception. The Apples should be gathered early, and taken to some dry and well ventilated room, where they should remain as long as it is safe to have them exposed to the cold. There are two very important points to be gained by this process. 1st. The Apples are undergoing a ripening process, while there is a constant evaporation of the more watery particles of the Apple going on, which of course decreases the quantity of Cider somewhat, but increases the quality in a greater proportion. And 2d. Cider made late in the season when the weather is cool will keep sweet much longer.

At this point, perhaps it will be well for me to speak of the manufacture, and the machinery used therein. I would say first, that it is impossible to make good Cider in a small way—I mean by grinding and pressing immediately, as is the case with all the hand-mills and presses that I am acquainted with. There are many of these that are very convenient for making a few gallons of Cider at a time for immediate use, but none fit for business. They are good *man killers.* The mill that we have used, and found most economical, simple and durable, is the grater mill—a cylinder about ten inches in diameter, and the same length of face, driven full of shoemaker's heel tacks, and then ground down to about one-eighth of an inch in length with a file. This suspended on a shaft, and driven by one or two horses, is capable of grinding one bushel per minute, and so fine that many of the seed are cut up. The mill is placed on a frame, over a large vat, made of plank, and keyed up so that it will hold liquids, which will hold sixty or eighty bushel of Apples when ground. The pomace are allowed to lay in this vat from twelve to thirty-six hours owing to the temperature of the weather. If the mill cuts the seed much it will not be safe to let them lay long, as the seed will impart a bitter taste to the Cider. The action of the atmosphere, on the disorganized flesh of the apple, converts a portion of the starch and gum into sugar, and the Cider will be found to be much sweeter than that made from the same Apples, pressed immediately after grinding. The quantity will also be much greater, as the unground particles of Apples become soft and give out the Cider more freely. Nor is this all. The Cider will be much cleaner than if pressed as soon as ground, then there are many fine mealy particles of the Apple, that will run with the Cider, that become tough and spongy if left for a while, and would remain back. These particles of the Apple, are that much fuel to the process of fermentation, carrying it that much farther than it should go, resulting in a filthy deposit at the bottom of the cask, from which the Cider takes a bitter and very unpleasant taste. The press may be of almost any desired capacity, but I find that for ordinary use, one or two barrels at a pressing, is most economical as the press operates more thoroughly on a small than a large mass. The press should be located near enough to the end of the vat, to enable a man with a shovel, to place the pomace upon the platform of the press, without having to change his position. A cheese, or pressing may be prepared in gunny cloths, similar to those used in the manufacture of oil. They are layed up in boxes, which are then removed, leaving the pomace encased in the gunny cloths. There is no loss of power in this method, as there is by the friction on the frame or crib, besides it is much cheaper, and so simple that any person can soon learn to prepare a cheese.

A pressing put up in this way, of thoroughly ground Apples, two feet square (a cube) will yield from thirty to forty gallons of Cider. The cheapest press probably that can be constructed, is the old fashioned lever or beam, morticed through a tree or post, but it is subject to a great many serious objections. The lever does not press directly downward, but tends at first when the end of the lever is above a horizontal to push the cheese forward, and after it falls below this line, the opposite effect is observed to take plaee. A lever is also unwieldy, awkward and inconvenient to manage, besides it has to be long and is troublesome to house.

The screw is another mechanical device, which has long been used for presses of various kinds, which is likewise subject to many objections. But combining as it does compactness, with a straight forward or vertical motion, is preferable to the lever. The greatest item of difference in favor of the lever is its cheapness.

There are many other kinds of presses, such as the eccentric, hydraulic, &c., but they are all too expensive, as well as more powerful, than is absolutely necessary for Cider making.

I now drop this part of my subject, and go back to the Apples, which we left housed, and undergoing the necessary preparation for the mill. These should now be carefully assorted over, discarding unripe and shaded specimens, as well as all that are in the least affected by rot, remembering that *rotten* and poorly ripened Apples do not make *good* Cider. Leaves and filth of all kinds, should also be thoroughly sifted out. Leaves are *very* objectionable as they impart both color and taste to Cider.

Every part of the mill, and press that come in contact with the Apples, should be well and frequently washed, as the Cider that is absorbed soon sours, and imparts a yeast to that, that flows over, or in any way comes in contact with the same, hastening and extending fermentation. The Cider, as it runs from the press, should remain quiet for a short time, in a large vessel, where it will deposit a large amount of sediment that cannot be got out any other way so easily. After this is done, draw the Cider off carefully and filter it through a series of cloths, beginning with one very coarse, and finishing with fine. This may easily be done by suspending the cloths one above another, not so near however as to bring them in contact with each other, as in that case they soon choke up. It is run from this filter into *new* barrels, as no others should be used without thorough steaming. Barrels that have had vinegar or sour cider in them are wholly unfit for Cider. *New Cider, like "new Wine" should be put in new bottles.*

Cider made and put up in this way, needs no sulphate of lime, pepper, mustard, or anything else to *keep* it. Better let it get *hard*, than to spoil it by doctoring, for then you may make the best of vinegar from it, which cannot be done when foreign substances have been used.

We are just approaching an era when Cider making and the manufacture of pure Cider Vinegar, will be of great importance in our State, and he who first establishes a reputation for honesty, and neatness in this line, will open a vein of pure gold, richer than the mines of California.

The following communication received from the Commissioner of Agriculture, was read before the Society:

DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C., December 28, 1867.

Secretary Indiana Horticultural Society, Indianapolis, Indaina:

DEAR SIR.—Believing that the usefulness of the Department of Agriculture and its efficiency in the prosecution of its appropriate work must depend greatly upon its relations with Agricultural organizations, I desire in assuming the duties of my official position, to invite your co-operation, to claim your counsel and to tender to you my hearty sympathy in your local enterprises, and any practicable help towards their successful development.

It is believed that such unity can be promoted by harmony of feeling and action between this Department and State Societies as between organizations and County Societies and Town Clubs.

The influence of State Boards and Societies upon the Agriculture of their respective States, is already incalculably great; yet they are only in their infancy, with many difficulties to surmount and discouragements to face, and may be aided by judicious action of this Department, which in turn may be strengthened by association and labor with those local organizations.

It is not my purpose to attempt to designate the modes in which this unity of action can best be obtained; they will present themselves for your considerations in your daily experience; but I will venture to hint at a few obvious points in which you may always be able to advance the interests of this Department and of Agriculture.

You can render more successful the operations of the Propagating Garden, in testing the merits of new seedling fruits, by sending such as have attained local promise of value for experiment in a different latitude under varying circumstances of treatment and culture. The receipt of seeds not tested will be properly acknowledged, and all plants and seeds when desired, will be held subject to the control of the doner. Any new variety of fruit, not yet disseminated, may confidently be considered safe, not liable to premature distribution to the injury of the originator. You can also render valuable aid, in the study of diseases of fruit trees, by sending accurate accounts of their history, progress and effects. The result of local observation and experiment is desired with a statement of influencing circumstances, including especially the hygrometric condition of the atmosphere, dew-point, elevation, shelter, etc.

For the museum, or object library of the Department, specimens of natural history, of seeds, fruits, fibres, minerals and the products of the economic arts, are solicited. It is intended eventually to furnish State organizations with model duplicates of type specimens of their most popular fruits.

The building now in progress of erection for the Department will furnish ample accommodations also, for a separate display and classification of products of agriculture and the minerals of the several States, contributions for which object are now solicited. It is believed that this will prove an interesting and useful feature of the museum.

In Entomology incalculable good may result from correspondence relative to insect depredations, with samples of the insects for identification, description and experiment.

The co-operation of State organizations in the collection of Agricultural statistics, will contribute materially to the success of the Department operations and to the general fund of Agricultural knowledge.

The results of local association and effort, whether of County Society exhibitions, of club meetings, implement trials, sheep shearings and other gatherings, might be presented in epitome, supplying facts, that might not otherwise be so fully received; and reports in detail of special agricultural enterprise, of systematic experiments of individuals and other occasional data, would serve to enrich the national repertory of industrial facts, and disseminate generally to other States a knowledge of the peculiar resources and improvements of each.

This co-operation might perhaps be extended with advantage to the monthly crop returns which form the basis of current approximate estimates of growing or harvested crops, by recommendation of the best men for reporters, in those Counties which cannot be represented by Secretaries of their Agricultural Societies; and by concurrent data from other sources, and suggestions as to any peculiar or local subjects of inquiry.

The idea is also presented for the consideration of State Societies and State Boards of Agriculture, of a still more intimate co-operation, involving the direction of returns to the offices of State Secretaries in those States, their examination and condensation, and a report of results to this Department for incorporation in the general statement for the entire country. Your views upon the above suggestions are respectfully solicited. In return I shall always hold myself ready to answer any reasonable demands upon the resources or courtesies of the Department.

am, respectfully,
HORACE CAPRON, *Commissioner.*

D. V. Culley spoke at some length, pitching into Dr. Matthews for his views relative to marketing fruit, and speaking very highly of Wm. H. Ragan's paper on Cider Making.

M. L. Dunlop, of Illinois, said that he would like, if the essay of Dr. Matthews was published, it be with the fact that he came from Indiana. He said there was no danger of overdoing the fruit business, or overstocking the markets. Dr. Matthews had said the market at Chicago was broke down. If two thousand bushels per day would suffice this year, it would require four thousand bushels next year. The market was increasing, and he referred to the grain market of Chicago, and compared its present status with what it was a few years ago. He spoke of the town near where he lived (Champaigne), a town of three thousand inhabitants, where they could scarcely sell eight bushels per day; but when the Chicago market broke down, they put the berries down to a price that consumers could afford to buy them for food, and they found a market at home. Instead of eight bushels, they used fifty bushels per day, and he found, upon inquiry, that there was but one-half as much flour, and one-third as much beef used as before the strawberry season. We must produce the strawberry in abundance, and sell at the very lowest rates that can be afforded. Put them in as *food*, and the people will eat immense quantities, and the producer will be well paid, for horticulture will produce more food than husbandry.

In speaking of the Apple, he said we must know when to gather, how to pack, and when to market. In sorting our apples, we take the first quality for market, second for cider, (which will make an article of drink, if properly managed, that people will buy and relish better than "corn sod" whisky). Put the third class or refuse into vinegar, and the outside world will buy all our surplus. We should study to feed ourselves.

Since he had examined the fruit in the Chicago market and found that the trouble was in packing, we should learn to put it in packages so as not to be injured by friction. In putting apples in barrels, we must press them down. All fruit, even (as we heard last night) Grapes will bear pressure, and we must compare notes, and find out how to do everything cheap. He said, unless we look sharp, they of Illinois would be ahead, for they were going to ask us to cut down our forests to make packages for fruit, and unless we planted screens and timber belts, as they were doing, we would find when our forests were used up and the cold wind let in on us, we could not raise fruit and they would have the market.

Indiana does not furnish itself with Strawberries. We commence shipping in Southern Illinois early in the season, and the season of ripening moves at the rate of about ten miles per day. The great market is to the North. Railroads are a good institution, but are a little old fogy. They do not comprehend the amount of fruit they carry to market. They should have a special train, and cars well ventilated. Spoke of a refrigerator car made specially for the purpose, in which the fruit is kept cool by air passing over ice. He went with such car, and found that the fruit kept well, and was in perfect order on arriving at Chicago.

R. S. Ragan, of Greencastle, thought railroads should furnish such cars, to keep cool in summer and warm in winter; thus we could ship at all seasons of the year to points North or South.

J. T. Francis, of Indianapolis, asked how long the Strawberry would keep in Chicago, after being carried in those cars.

M. L. Dunlop—Forty-eight hours. The berry is kept only cool, not chilled. Said at Lake Superior the Strawberry is not ripe till July. The people there, particularly those working in the mines, need acid fruits, and we could send them to them. The Strawberry season, instead of being two weeks, should be three months. Indiana is destined to be a great manufacturing State, and they should and will be impressed with the fact that the very best food is horticultural products, and it is absolutely necessary that they be put in market in good condition. Let your railway men know this, and they will accommodate you. You have here the material for the fruit boxes and packages. You have the facilities for manufacturing them, and you can raise the fruit, and come in competition with the surrounding States. I shall want occasionally to come over and get all the new improvements, and when we come in competition, we can feed the world cheaper than the husbandman, and this would improve the general health of the people, and all would be benefitted except the doctors, and we could find some other employment for them.

President spoke of packing Apples. Said he never packed anything but fine Apples. Put them in barrels, and pressed them in so they would not rub. Had shipped to Chicago with good success.

M. L. Dunlop—It is absolutely certain that Apples must be packed solid. You can tell whether a barrel is packed well by tapping on the head with the fingers. We, as Horticulturists, should establish a character that we can sell anything by brand. In order to do this, we must pack just right, and practice honesty throughout, and dealers would sell for a less per cent. where there would be no necessity for re-packing, thus saving a deal of trouble and expense.

W. H. Ragan had been interested in the discussion. Said there was necessity for great care in sorting the fruit. If this was properly attended to, and the barrels correctly branded, there would be no necessity for opening; and after establishing a reputation better prices could be realized. The Apples should be well pressed in, and the barrel properly secured, as the railroad hands handle very roughly.

M. L. Dunlop said the whole supply of vinegar of the Northwest was a drugged article, and they had difficulty in selling a genuine article till it became known; then they found no difficulty whatever.

Adjourned to 2 o'clock P. M.

AFTERNOON SESSION—SECOND DAY.

On motion, a committee of three was appointed to examine implements and machinery now on exhibition. Committee—Amos Alderson, Thomas B. Morris and Mercer Brown.

M. L. Dunlop, of Illinois, delivered an address on packing and marketing fruit.

Mr. President and Gentlemen of the Indiana State Horticultural Society:

A new condition of things is presented to the rural population of this great valley; a condition that demands more capital, more labor, and lastly, though not least, more active brain work. New industries have brought us more population, not to compete with us in the culture of the soil, but for us to feed; to consume at our doors, and within short distances, the more profitable products of our fertile acres and pains-taking toil.

It was but yesterday that we were a pastoral people, or at least the husbandry which was limited to the pasture and the grain field represented our rural wealth. Those days are departed, no more to return, and with them we lost, though no loss in fact, the low, steady hum of the spinning wheel, plied by busy fingers, and the discordant clamoring of the hand loom. Here, amid bending orchards and fields of yellow grain, where the locomotive gives his note of coming, where the river is harnessed to fast revolving wheels, where the laboring engine is fashioning the raw products of field, of forest and of the mine to articles of use, may the last solos of their departing music die upon the air as they pass to that bourne that embalms them in history. No longer shall the drover take up his line of march, with his thousand bullocks, to cross the Alleghenies to reach the market of the seaboard, after three months of toil and exposure. No longer shall we see long lines of teams winding their toilsome way over far reaching prairies, over the causeways of the old forests, through river fords and unbridged sloughs, to reach the steamboat landing or the lake port; for the Genii of Steam is in the iron rail, making mockery of seasons and of climes, breaking up old habits and giving us new ideas of the world's progress. New life courses through all the arteries of commerce; infusing into all new needs, with the power to gratify them. A change more radical never swept over a nation than is now taking place in this great valley of the Upper Mississippi. From where Cairo stands sentinel to guard the pass where winter bridges the rivers of the North, to the East, where the Alleghany rears his Metamorphia crest, to the West, where the Storm King sits enthroned on the granite dyke of the New World, to the North, where the sun fades out into night, they demand of us the products of the orchard, the vineyard and the fruit garden.

Reticulated by railroads, drained by navigable rivers, washed by the great lakes and traversed by canals, we have an inland commerce that shall be adequate to distribute these new products to all points of demand. If the last ten years have brought such a change; if the first breathings of steam and the first efforts of iron muscles, have made such demands on our industry, what will it be within the next twenty years? When wine shall be grown in the vineyard, not made of corn whisky, water, sugar and drugs; when brandy for the invalid shall be distilled from grapes, not made from molasses, corn whisky, water and sugar of lead; when vinegar shall be the product of the orchard, not tartaric acid, rain water and molasses; when cider shall be pressed, not washed out by the aid of water; when every human meal shall be a feast largely composed of the products of the orchard and the fruit garden. Such will be the case—the intelligence of our people and the wealth at their command will demand these changes.

We shall make no attack upon husbandry, but rather aid it, by incorporating it with our horticultural pursuits. The relationship between the two are mutual, and should be fostered. If we reduce the *per capita* consumption of beef and pork in our own population, the commercial demand will be equal to the supply; if we ruin the craft of those who amass fortunes by adulteration of articles of common use, we shall increase the general health. If we can provide richer and more healthful food at comparatively cheap rates, we shall invite to our valley the skillful artizans from the shops of the old world, and make our valley the seat of mechanical and commercial greatness.

In considering this new condition of things, we must examine it in all its relations and duties, with a view to derive the greatest benefit from it. To do this we must master the details of the new industries, that they present for our advantage. The leading staples of the orchard and the fruit garden are the apple, cherry, pear, peach, quince, the blackberry, currant gooseberry, grape, raspberry and strawberry. All of these fill an important place in the progress of the seasons, and cannot well be spared, whether we use them raw or cooked or canned Some of their manufactured products have an important commercial value, and are destined to come into more general use. Grapes for wine and brandy, the apple for vinegar and cider, and the small fruits for cordials.

A few years since, with the exception of the apple, and to some extent the currant, all of these ranked among the luxuries; now they are rapidly becoming the prime necessities of the table for all classes of our population, and are classed with the staple articles of food. Just in proportion as they have come to the tables of our people, in that proportion has the general health been improved.

If sorghum shall be able to supply syrup for our use; if the beet root for sugar shall outrank in point of profit the cane of the South, these two great staples will also come under the dominion of horticulture, and add largely to our resources.

But our present business is in regard to the new demands for the products of the orchard, the vineyard and the small fruit garden. We need not go back to the fact that our first parents were confined to a simple fruit diet previous to being driven from the garden; that the people of the old time, who preceded the flood, were all fed on the product of husbandry; that when the earth was thrown askew the eliptic, to give us the seasons of springtime and harvest, of summer and of winter, that as some compensation, the All Father gave us back Horticulture as a means of retaining man in a more direct relationship with his Maker.

And as the years roll on towards the millennium, the desire for the fruits of the garden grow upon the world's appetite. The meat eating Indian is fading away; the cannibals of the isles are yielding their places; and to-day the most prosperous nations are those who give horticulture a high position in their rural economy· Aside from these considerations, we have others of a more pressing demand—one that involves the welfare and progress of this great valley of the West. We must now meet the issues and carefully investigate the details that are required to give us the surest road to success.

To a great extent we must fall back upon our own resources, for the libraries are mainly made for other men, for other times, for other climates and for other soils. With our great variety of soils, the peculiarity of our air currents, the depth of our inland valleys, and the exposure of our table lands, the immense area of prairie drift, the long lines of marly bluffs that border our rivers, and the deep grooves cut by the Missouri, the Mississippi and the Ohio, the elevation of the lead region, the great Hieronian dyke of fossil minerals along the margin of Superior and in Southeast Missouri, the hills of silicious conglomerate that make up the "grand chain," and the river marl that overspreads the basin of upper Egypt, all conspire to puzzle our minds in regard to the location that will best meet the ends in view.

Shall we plant our vineyards in the deep, rich loams of the prairies, along the river bluffs, or shall we hew down the forests east of the Wabash for the purpose? or shall we plant all alike? Shall we plant our orchards on the "grand chain," on our river bottoms, or where stood the old forests? or shall we study the soil and the climate, and learn the peculiar needs of each particular product? If the vine needs a particular summer temperature for the profitable production of wine, we may not go beyond that limit; if the fruit for the table can be grown outside of this line, we should so understand it, and not throw it away on a product for which it is not adapted. If the peach produces annual crops only in certain localities, we should not plant it out of those districts, with reasonable expectation of profitable returus.

It should be our study to ascertain the requirements of these several fruits, so as know where each can be grown to the best advantage. To illustrate this part of our subject, let us take that district of country that lies along the great thoroughfare that leads from Cairo to Chicago, the distributing point for that section, for the same reasoning will apply to all other sections that have commercial centers, to send out the products that are thus gathered in. It is one of the laws of trade that we must have a system by which goods are accumulated and a market price put upon them, before they are distributed to the consumer. The idea of the consumer buying from the first hands is a fiction as a general thing.

From Cairo to Chicago is three hundred and sixty-five miles; but the first point where horticultural products can be grown is fifteen miles north, and at an elevation of two hundred feet below the level of Lake Michigan, and about four hundred above the ocean. At this point (Villa Ridge) the strawberry begins to ripen May 5th, and closes the season June 1st, and before the same fruit is half grown at Chicago. Thus the season for this fruit marches at the rate of about ten miles a day, the march being retarded or accelerated by the elevations and depressions. In two days it reaches the prairie country at Desoto, where it makes a stand of almost a week, when it makes rapid strides through the basin of "Upper Egypt;" it halts at Effingham, and then slowly ascends the northern rime of the old lake, and pauses at Mattoon. Steadily it moves on to the valley of the Kankakee, where, meeting the damp, cold wind off Lake Michigan, the progress is again slow. While the average progress is as stated, there are stations, as it were, on the way. Later in the season the march is more rapid as the growth is proportionally more rapid, at the north as summer culminates. If we follow this line north to Lake Superior, we find the season of the strawberry closing the last of July, making a period of three months that this fruit is in full perfection on this direct line of the march of the seasons, and everywhere on this line, this most valuable of all the early fruits can be grown almost equally well. It is the fruit for all soils and all climes. If the soil is too poor, enrich it with manure; if too dry, apply a coat of mulch; if too wet, throw the land in ridges, or under drain; if exposed to damaging winds, shelter with forest growth; if too hot, the fruit will nestle under its own rich canopy of leaves; if too cool, its fruit stems push into the open air. So suited to all conditions of soil and climate, it is a wonder that the world had not long ago crowned it the Queen of the small fruit garden.. But we do not want this fruit, however valuable, for three continuous months. It is the first valuable gift of the fruit garden in the spring; just when the system and appetite crave its delicious acid, and the eye feasts on its rich crimson berries. Now in rapid succession, the South part of the State sends North its Early May Cherry, the Black Cap Raspberry, the early Blackberries and Apples. Her sunny skies and genial soil are more than a match for hot-beds and glass houses; laughing to naught the system of the productions of early fruits so long canonized in Europe, and turning the teachings of the old gardeners into ridicule.

Of what value a range of green houses in Chicago, filled with the early fruits, while the hillsides of the "grand chain" are growing them by the thousand acres, and will pour them into the market by the car load and by whole trains! I ask if this is not a new condition of things that we are bound to respect, and to which we must bow in meek submission? Make your center of distribution where you will, and send the railroad south on its mission of progress, and your green houses will be no match against cheap freights in the market race.

Talk of peaches and pears on walls and *espallies*, under glass or sheltered from the north wind, where the whole country for one hundred and fifty miles can be made one extended peach and pear orchard; sending this luscious fruit to the market of the North by the first day of August, just as the miner on the shores of Superior has disposed of his last dish of strawberries; not only in car loads, but in whole trains daily, until the frosts of November closes up the season.

The early apples, pears and plums come under the same general rule, and make more profitable returns when grown a long distance south of the point of consumption. So of the vegetable garden. Hot-beds and glass structures are no match for the iron rail, the locomotive and the great orb of day. It is this that has so developed these horticultural products, and made them staple articles of diet. Without the railroad, the season of the strawberry at any given point would be from two to three weeks; of the May cherry, the raspberry and the blackberry, the same each; the peach for two months, the pear for three and the apple for nine.

We have seen that this new condition of things brings these products within the reach of a class of men who were but simple husbandmen, and who now come in direct competition with the old gardeners. The latter will have the advantage in the race, for they have depended on open culture, know better how to guard against the accidents of the seasons. Therefore to a new class of men is mainly intrusted the task of supplying us with these new staple products of the orchard, the vineyard and the garden.

After we have selected the fruits that are best adapted to our special location, we have other duties devolved upon us. We must know how to gather, to pack for shipping and how to market.

We must learn to take the strawberry from the vine and place it in the box in which the consumer is to receive it. We must know the best sized packages for the several fruits, and the best mode of packing. These are mottoes of mechanical detail that must be learned like any other trade or business. The frictions of long lines of railroad transit, is an important item to guard against, and to which we may charge a large part of the losses on what we call perishable articles. The delicate tissues become ruptured, and decay makes rapid progress. A barrel of apples loosely packed will be ground to pomice in a hundred miles, if fully ripe, when, if they had been properly packed, they would have reached the market in good condition. Yellow skinned apples, as a general thing, are more tender than those of red or crimson.

Thus far the rule has been to gather the fruit before fully ripe, and let them ripen up in the sweltering cars on their rapid transit to market. This practice has largely deteriorated their value in several ways, and it is now proposed to the railroad companies to provide cars with light steel springs, and with refrigerating apparatus, with a view to maintain the fruit in a condition of *statu quo* during the transit. That this will be accomplished we have strong encouragement, from the experments made last year by the Geneaal Superintendent of the Illinois Central Railroad Company.

What a boon will be conferred upon the health of our cities and towns if we can give them fruit ripe and fresh from the orchard and garden. That it can be done there is not the least doubt. The experiment has been sufficiently tested to warrant us in placing the business on a sound basis.

Mr. Dunlop for more than an hour discussed the great advantages of this State for all the staple products of horticulture belonging to the Temperate zone. While he pointed out the great advantage of the shelter derived from the forest walls that now modify the cold winds of the north, and thus make the change less sudden, yet he cautioned us against an indiscriminate cutting away of those woody shelters, for they have their uses, and, in fact, cannot be dispensed with. The orchardists on the open prairie are planting shelter belts extensively, and at no distant day they may be able to compete with us in our own market.

Mr. D. called special attention to the advantages of a northern market for all this class of products, and he dwelt on the fact that under what he calls this new condition of things, hot-beds and glass houses will, to a great extent, be dispensed with, Suppose, said he, that some man in Chicago should put up a thousand feet of slips for grapes. By the time that he could possibly have them ripe, the planters along the sunny slopes of the Ohio would send them to the same market by the car load, and at such prices as would bid defiance to competition. God's sunlight and cheap transportation are too much for glass and hot water pipes in the race for economy.

On motion, the following resolution was unanimously adopted:

Resolved, That the thanks of this Society be tendered to Mr. Dunlop, of Illinois, for his address on the subject of fruits and the best method of preparing the same for market.

M. L. Dunlop, of Illinois, gave an illustration of his mode of grafting the cherry, said every farmer should have a good supply of May cherry, and that they could take the common Moorillo sprouts that come up around the trees in abundance and graft them, by cutting off the stock and running the knife down the side of the stock, cutting, but not splitting and rupturing the bark, and splitting the stock half through, then taking a scion 4 or 5 inches long, cutting to a wedge, cutting one side smaller, so that it becomes wedge-shaped on the side as well as the end, and insert it in the side of the stock, so that the bark of the stock and scion are even, (the other side of the stock not being split holds it in place,) then put on wax as other grafting.

Every farmer should and would put up from 5 to 10 bushels of cherries for his family use if they fully understood the value of the fruit and the little difficulty of raising it. Yes! if all understood this matter in its true light, the May cherry would be held in the highest estimation by all, worth more than all the pork; but their general use with other fruits would be ruinous to the Doctors.

Some discussion arose on the subject of cans. Some were in favor of tin cans, but many were decidedly in favor of glass cans for family use.

M. L. Dunlop spoke of some one having referred to an apple for drying; said that the man that would dry apples now, when we could have all the fruits fresh in cans, was behind the times, for drying apples was played out, and the man that follows drying apples for market will be left out in the cold.

On motion by Jos. C. Rutliff, of Wayne county, the following resolution was unanimously adopted:

Resolved, That the communication from the Commissioner of Agriculture to the Society, touching upon the various subjects connected with the Department, and asking the co-operation of this and other State and county societies in carrying out the objects of that Department, meets our entire approbation, and would say in return that we are pleased to avail ourselves of the opportunity of advancing the cause of Horticulture, as proposed by the Commissioner.

Adjourned to 7 o'clock this evening.

EVENING SESSION—SECOND DAY.

Lewis Jones, of Wayne county, spoke of the soils best adapted to the apple tree. Said he had found (by a number of years of observation) the best bearing orchards and the longest lived trees on a white clay, beech land. There was another soil a little different that was good—white oak and hickory, with clay subsoil—what some term hazle land. Some think they want a rich land for apples, which is a mistake; always take a rather thin clay soil for apples.

R. S. Ragan said, in the counties of Hendricks and Putnam there was a class of soil—timber hickory and white oak—a close clay—had found more perfect specimens of apples on this kind of soil than on the rich alluvial soil. The finest fruit is brought to market from these parts. Some varieties do not show so much difference, and are not so much influenced by the soil as others. The trees do not make so much growth, but are more hardy and long lived.

Lewis Jones spoke of the effect of frost on the low, rich lands.

Dr. Furnas said there were currents of air; the cold veins generally followed the low ground, and warmer ones on the higher land.

Jos. Pool, of Attica, said he could not see the force of the argument relative to soil. In setting they dig a large hole and put in rich dirt or a little manure, though in most things the soil could not well be too rich, and was rather of the opinion the same would hold good with fruit trees as well as other things; had found it a good plan to put a little partly rotten manure around the tree.

J. H. Vajen, of Indianapolis, spoke of an old orchard that had nearly failed, when a Swiss gentleman took charge of it; he dug the soil away from around the root of the tree and filled up with rich, bottom soil, and had plenty of apples. He showed a fine specimen of cider, and asked why, with so much fine fruit, we should not have a pure article of cider wine.

J. C. Ratliff, of Wayne county, said he had observed that trees planted on rich soil were short lived, but that they produced nice specimens while they did live. Had noticed that orchards on high land, with gravel subsoil, live longest; thought we ought to be governed by good sense in planting trees; had dug large holes in clay soil, there coming a rain the water remained; come to the conclusion that he was digging a basin that would hold water and injure the tree; set the balance of the orchard without digging much hole, and in some cases none, and found the trees did better than where the large holes were dug.

President Nelson said part of his orchard was second bottom; he had lost a great many trees, particularly the Baldwin; spoke of a neighbor who had very poor clay soil who succeeded in raising very fine fruit, particularly Green Newton Pippin; the practice of digging large holes and making a great preparation was played out. Put the ground in order as for corn, and plant without digging any more hole than sufficient to give room for the roots. On his land trees grew well but were in danger of the cold winter. Trees in poorer soil do well, but the thin, beech lands are better for apples than any other; the fruit may not be so large but very smooth and nice; young trees grow fast enough on any soil if they are *cultivated;* he considered corn a good crop for a young orchard the first year.

J. C. Ratliff—How long should a tree be cultivated?

President—There is no danger of cultivating it too long.

R. S. Ragan said there was danger of being misled; we could raise good fruit on rich soil, and, he believed, after a few years on poor soil, (which he considered the best for apples;) it would need a little manure. In setting on low, wet land he would set the tree on top of the ground, raising a mound of earth around the tree, instead of making a reservoir to set the tree in where it would be soaked to death.

Dr. Furnas asked if there was anything in the way a tree was set out. Some persons believe the same side should be to the north as it stood in the nursery; said the rabbit always injured the side to the south-west.

Lewis Jones said because the trees were not frozen on that side; the rabbits would not bite where the bark was frozen.

J. H. Vajen said his stepfather (a Swiss gentleman) was of opinion that a fruit of fine quality wanted a soil of fine quality.

Dr. Mears, of Indianapolis, said he thought gentlemen were not on the right course. Why do they not go to the element that the tree needs; perhaps the soil put around the trees, as referred to by Mr. Vajen, contained the very element that the tree needed; but we should ascertain what element the tree needs, as for the strawberry, which requires limes, ashes and soda chemically combined. There is in every vegetable and in every tree an element suited to the growth of that plant or tree; if we want to find what is needed we must come at it chemically.

M. L. Dunlop, of Illinois, said he had been a good deal of the opinion of Dr. Mears, but after reading Liebig and studying the matter he had been a good deal staggered; there was a great deal of difference in the growth of trees, and thought there was a difference in the roots; said they had been experimenting in planting; dug one hole for all the trees, that was the whole field, plant and tend thoroughly; this is an absolute necessity, and as each farm *must* have an orchard some will have favored spots, while others will have to plant in situations not so well adapted; after planting ridge up, that is, throw the dirt to the trees in plowing and make a deep soil, and if the land is wet this will surface drain it; thought we should look more to the geological condition than to the chemical.

Mr. Smith, of Geneva, N. Y., said they planted on the highest, dryest ground; their ground was spungy, and had to be underdrained. In Orange and Wayne counties they raised better fruit than in the county where he resided, as they had natural ridges, in some places gravelly. This was better adapted, the roots would run deep, and could thus resist the cold better, and do not feel the sudden changes of temperature so much as where the roots run near the surface, as was the case in low, wet lands.

Dr. Furnas said that when at the Peach meeting, at Salem, last summer, he found the best peaches on the sharp, flinty knolls; said we must study the whole thing, no matter where we plant; spoke of the frost line and currents of cold air passing during the winter; we should examine these things, and where there is no protection plant wind brakes and guard against these things.

J. S. Mendenhall, of Wayne county, said we must plant the apple that suited the soil and climate of our immediate vicinity, thus we have to study this matter in every county separately.

Amos Alderson, of Plainfield, said there were apples that would do well in rich soil, as Gilpin, Milam and Roman Stem; said his plan in planting was to plow in the fall, making a deep, open furrow where the row of trees were to be planted, subsoil in the bottom of this furrow, let it lay till spring, then plow the dirt back, making a deep, loose bed of dirt to plant the tree in, then dig no more hole in planting than to just take the roots in a natural position.

Lewis Jones, of Wayne county, showed a very fine specimen of Milam, grown on land so poor that corn did not grow knee high; said May Duke cherries on the same ground bore abundantly.

President said the Baldwin would not do in rich soil, and his experience with some other varieties had been the reverse of what other members had said.

Adjourned to 8 o'clock to-morrow morning.

MORNING SESSION—THIRD DAY.

Reports were received from County and District Societies as follows:

REPORT OF THE PARKE COUNTY HORTICULTURAL AND RURAL INSTITUTE.

The Parke County Horticultural Institute, as stated in our report last year, was organized in the summer of 1865, at Bloomingdale, Indiana. We have had, however, a regularly organized Horticultural Society at this place dating back to the year 1859, which kept up its semi-annual fairs until the time of the present Institute.

Aside from our regular premiums on horticultural productions, we offer prizes for agricultural products and implements, for specimens of table comforts, fine arts, &c., endeaorving to adapt our exhibitions to the tastes and interests of a rural district.

In our Fair Grounds we now have a neat Floral Hall and a well-arranged Hall for the display of vegetables and implements, the latter building erected during the past year at a cost of about $275.00.

The Fifth Semi-Annual Exhibition of the Society was held on the 26th, 27th and 28th of September, 1867, and although the number of entries was not quite so large as at some of our previous fairs, the result was very encouraging, and was financially a success, paying all premiums in full.

The different departments were all represented, and in a part of them the display was much better than anticipated from the unfavorable season that we have experienced. In the list of fruits this was especially the case, and it has been remarked that this department was better represented than ever before. The entries embraced about 60 varieties of choice apples, besides numerous entries of pears, peaches, plums and grapes, the latter including tempting specimens of the Concord, Delaware, Catawba, Diana, Isabella and Clinton.

Our Society has recently held its annual election, and have elected a full Board of Officers for the ensuing year. The attendance of members at this meeting was large, and the interest manifested by those present speaks well for the future success of the Institute.

ALBERT HUNT,
Corresponding Secretary.

REPORT FROM BROWN TOWNSHIP, MORGAN COUNTY.

To the Secretary State Horticultural Society:

We have the honor of submitting the following report of the Agricultural and Horticultural Society of Brown Township, Morgan county, Indiana.

Said Society was organized June 28th, 1867, and held its First Semi-Annual Exhibition Oct. 12th, 1867. The number of entries in the live stock department was 116.

Other entries, including grains and seeds, fruits and flowers, vegetables, dairy and kitchen products, needle and millinery work, &c., were made to the number of 419.

The exhibition of fruits was excellent. The season being too late for peaches, we had none on exhibition, but the show of apples was very good. Among the fall varieties most highly prized by the farmers in our township, are the Rambo, Wine Apple, Maiden Blush, Fall Pippin, and the President, all good bearers but tender trees. Among the winter varieties which succeed the best here are the Janet, Pryor's Red, Wine Sap, White Winter Pearmain, Red Winter Pearmain, Newtown Pippin, and American Pippin, all of which are good bearers and hardy trees. The Vandever Pippin is a good apple, and is only a moderate bearer, the fruit rarely hanging on the tree till properly matured. The Golden Russet is a favorite apple among us, but the tree is so tender that they rarely live long enough to pay expenses of their cultivation.

The favorite grape with us is the Concord; and not far behind it stands the Delaware. The Catawba and Isabella are a very uncertain crop. Our farmers are beginning to appreciate the value of a few well cultivated grape vines on their farms.

Our exhibition of horses, sheep and hogs was the best we have ever had in Morgan county. We believe that a Morgan county farmer can spend as much time in looking at a fine hog as any other man in the State.

As our Society is young and not fully started on the race of agricultural and horticultural improvements, we will necessarily make our report brief, hoping that in future we will be better able to make our reports full, and furnishing information of more value than is embodied in the present one.

Respectfully submitted,
JOSH. L. HARVEY, Secretary,
Mooresville, Morgan Co., Ind.

President—ELI HARVEY.
Vice President—JAMES DAY.
Treasurer—ELI S. MOON.

EXECUTIVE COMMITTEE:

LEWIS ROBBINS,
DAVID HARVEY,
SAMUEL M. HADLEY.

HONEY CREEK AGRICULTURAL AND HORTICULTURAL SOCIETY.

This Society was organized in 1865, the object first being to promote horticulture alone, but owing to the interest many farmers manifested in the enterprise the Society re-organized and now holds two semi-annual exhibitions. The one in the spring is devoted to small fruits, flowers, fine arts, mechanism, &c. At the fall fair we exhibit all kinds of farm stock.

Our spring fair was well attended the past season. The number of entries good, especially strawberries, many of the specimens of an enormous size; so far the Wilson's Albany and Green Prolific, planted in alternate rows, seem to yield the most profitable crop.

The show of apples at the autumn exhibition was not as large as usual, owing to the specimens being small the past season caused by the drouth.

The show of pears, peaches and grapes was good; there were eight varieties of grape on exhibition, the Concord standing at the head of the list.

We think the Society has been of lasting benefit to its members and patrons, and is self-sustaining. We have held monthly meetings, where we have discussions upon different subjects, and sometimes appoint members to write essays, &c.

OFFICERS ELECTED FOR 1868.

President—JOHN RODKEY,
Vice President—JOHN SWANEY.
Cor. Secretary—J. E. HOLLOWELL,
Rec. Secretary—ENSLEY JONES,
Treasurer—ELI CARTER,
Gen'l Superintendent—LUKE FRY.

BOARD OF DIRECTORS.

W. J. FLOYD,
S. J. SCHOOLEY,
A. BISHOP,
S. W. ELLIS,
SAMPSON LETT,
H. W. JONES.

On behalf of the Society,
MERCER BROWN, Secretary.

REPORT OF PLAINFIELD HOTICULTURAL SOCIETY.

The Society has just closed a year of successful labor and entered upon the new with an extended field to investigate.

We have been bountifully blessed the past year with a rich return of fruits, beginning with the small fruits of June and ending with an unprecedented yield of apples; and our members, flushed with success, are widening their labor and extending Pomonia's domains till ere long we hope to be able to cope with many of our neighbors in sister States.

We have held one exhibition during the year, that of strawberries and vegetables, in the month of June last. Notwithstanding a late frost damaged many of the earliest strawberries, yet those exhibited were of a superior character, and the display and competition was greater than at any former exhibition.

Our location is well adapted to apples, and the numerous premiums that have been awarded our Society from time to time, attests the interest manifested in this branch of horticulture.

At our annual meeting the subject of the classification of apples was taken up and a system adopted thought to be superior to that of the "Star System," as in it not only the quality of the fruit is given, but the hardiness and productiveness of the tree is also shown, of which we subjoin a report. (See Fruit List.)

Another subject has claimed the attention of the Society since our last report, viz., that of the ravages of animals and insects upon fruit trees. During last winter nurseries and many young orchards suffered greatly. A committee was appointed to prosecute investigations concerning the matter, and at our annual meeting submitted a very valuable paper upon the subject, which is herewith submitted for your consideration.

We also forward reports on fruits for our location.

For the last two years our Society has been awarding premiums on Orchards and Fruit Gardens, and there being an increasing interest felt, it has recently extended the list to vineyards of 25 vines and upwards, strawberries of not less than ¼ of an acre, raspberries of ⅛ of an acre, also, blackberries and vegetable and flower gardens.

Our Society has also adopted the practice of appointing, annually, Standing Committees on the following subjects, viz.: Orchards, Fruit Gardens, Vineyards, Small Fruits, Entomology, Ornothology, and Vegetable and Flower Gardens.

The Officers for the ensuing year are:

President—JOHN H. NICHOLSON,
Vice Presidents— IRA MIDDLETON,
LAYTON HAWKINS,
ADAM JONES,
Rec. Secretary—ELLIS LAWRENCE,
Cor. Secretary—SETH W. PEARSON,
Treasurer—AMOS ALDERSON,
Librarian—ELIHU COX.

All of which is respectfully submitted.

E. LAWRENCE, Secretary.

The following is the paper submitted by the Committee on the Ravages of Animals and Insects on Fruit Trees:

"The Committee has given some attention to the subject, though perhaps not so much as the nature of the case demands.

"It requires no extended travel to enable any one to observe the injury sustained by the various kinds of fruit crops in our country; but, on the contrary, the evidence accumulates at our own doors, in our own orchards and our fruit gardens. But as it is a matter of nicety to define precisely the line separating the mineral and vegetable kingdoms, or define exactly where vegetable life ceases and animated nature begins, so we find ourselves plunged into a labyrinth of speculation with reference to some of the most troublesome affections of our best fruits; for, while some maintain that the predisposing cause is a fungus, others refer the trouble to frozen descending sap. While two theories differ widely, a third steps in and attributes the trouble to too much moisture; but to spoil all these, a fourth theory is that microscopic insects lay at the foundation of all this disease. A tardy growth, as well as a luxurious one, have alike received their due share of blame, and thus we might proceed; and the further we look, the more diversified and multiplied become the alleged causes of trouble. Aside from speculation, your committee find enough of positive, tangible foes, without running after visionary theories, and will therefore proceed to the enumeration of some of those that have fell more immediately within the range of their observation.

"The first to which we call your attention is the apple tree borer. This insect is a kind of providential punishment for careless cultivation. It may make an occasional mistake and attack a thrifty tree, but it generally prefers operating about some diseased or injured point, such as the place of removal of large limbs, or of bruises from chains or the plow in cultivation. There are various remedies for this little pest, all of which are more or less effectual. One of the surest is to 'catch him and kill him.' Another is to cut his head off; but as catching comes before hanging, the point would seem to be the capture of the borer. While it is young, and before it has penetrated deeply into the tree, this is often easily done; but if it has worked to the heart of the tree, the operator or tree surgeon generally comes off second best, for, as he obtains the grub, he destroys the tree. It is, therefore, best to use all possible preventive means, and for this means soap or soap suds are the best.

"The currant worm, which has done so much mischief in some localities, gives us but very little trouble. Indeed, it may be very justly doubted whether we have the real currant worm. However, we have occasionally observed a dead shoot that exhibits symptoms of this worm. Burning infected limbs and exercising due caution with reference to purchasing from infected districts appears to be the remedy. The chairman of this committee would remark that he procured currant cuttings from Bloomington, Ill., which had live specimens of the currant worm, all of which were burned.

Curculio.—This great mischief maker has, perhaps, more sins to answer for than any other insect with us. To the plum it is the root of all evil, completely destroying every vestige of this delicious fruit. It is true that occasionally there are specimens to be found too sour for his Turkship, with vulcanized skins too tough for his lance—sad representatives of what remain far back in the ledger of our memories with reference to the sweet, melting, delicious plum. But his work does not stop here. It deposits its egg in the peach, stings the apple, deforms the pear and attacks the apricot and nectarine. Many are the remedies that have been broached for the little pest, but few of them have proved of any practical utility. At one time it was thought that the Curculio crawled up the trunk of the tree, and it was proposed to fence him off by various means over or through which he could not pass; but this utterly failed. Lime has been recommended, and from the reliable testimony in its favor it may admit of further trial, yet it has been pronounced time and again a failure by the best authority. Jarring the tree, if thoroughly and persistently brought to bear, has universally been successful where the insects and defective plums have been caught in a sheet and burned. E. W. Scearce, of Danville, the past season, succeeded completely, by digging a hole in the ground and keeping a lighted fire each night, for about six weeks, in the immediate vicinity of the plum trees. He says the curculio flew into the fire, and was thus destroyed; at any rate, he succeeded in raising a crop of plums. These lighted fires are effectual destroyers of most of the insect tribe that fly at night. He says he thus destroyed millions.

"The white grub occasionally does considerable damage to the strawberry plant. He is a slow operator, but very sure, and the remedy is, in most cases, as bad for the plants as the grubs. Perhaps the best plan would be, in a lot badly infested with this disgusting pest, to turn in a lot of pigs, and let them root out the grubs, which they will do pretty thoroughly in time, and abandon the idea of strawberry culture on that ground until it is renovated.

"The Rose Bug.—This is the *macrodactylus subspenosa*, and we ought to be thankful that anything with such a terrible name has not yet been introduced into our vineyards. It was reported, however, by a gentleman at the peach meeting at Salem, as completely defoliating three hundred thrifty grape vines in that immediate vicinity. The remedy seems to be, 'catch 'em and kill 'em.'

"Phemphigus piri, or apple tree blight. This is tangible to the naked eye only by the appearance of something resembling mould. Of their habits and character your committee know but little, further than that they are to be found on apple tree roots, and that they grow very near the surface, and as a consequence, the roots become warty and knotty, and in very bad cases the roots decay altogether. This little insect is said to be bred in the root, thus inducing those warty excresences above noted. The remedy recommended is deep transplanting; or if the tree is not to be transplanted, add a few inches of surface soil around the tree, which Z. S. Ragan, of Danville, assures me will destroy them. Dr. Warder recommends soapsuds as another valuable remedy. The microscope shows how clumsy the specimens appear, and yet they hold on very closely to the root.

"The common potato bug, or American blister fly, is too well known to all to need a description here. Its work of destruction upon our potato vines, tomatoes, beets, and sometimes cabbage, to say nothing of the various kinds of ornamental plants, is well understood by every gardener. This is a non-combatant of a migratory habit. If it can be allowed peaceable possession and the free exercise of its inalienable an constitutional rights in a potato patch, it will enjoy itself in fine style. But the rude treatment they often receive at the hands of men and boys, is quite damaging to their worldly prospects. A good brushing will generally frighten them away. Sometimes, however, it is necessary to repeat the dose a time or two, but if they are kept pretty well worried for one day they are very apt to leave the succeeding night. When they determine upon a move, they may be seen just at dark climbing the tallest weeds or plants within their reach, from whence they start, all going the same direction.

"There is another potato bug coming upon us from the foot of the Rocky Mountains. This is called the *doraptura ten lineata*, or ten striped spearman. This bug is already in Illinois, traveling eastward at the rate of 50 or 75 miles annually, literally destroying potatoes, tomatoes and horse nettles wherever he goes. It is calculated that this pest will be in Central Indiana in about two years. It attacks the potato plant when it first appears above ground, and is often in such quantities as to keep the crop entirely cut to the level of the ground. The remedy is 'catch 'em and kill 'em.' This bug continues to breed all the season, and such is its fecundity that Benjamin D. Walsh, of Rock Island, Illinois, estimates the progeny of one of the first females of a season, in children and grandchildren, by the millions. Turkeys are the only aids to man in combating this insect, as they eat them freely —even fatten on them.

"The tent caterpillar is familiar to us all, and is often suffered to spread his tent from branch to branch in the apple tree without molestation. This should not be allowed. Upon the first appearance the nest should be destroyed, or, if it is very large, remove the entire nest, limb and all, and burn them.

"The peach tree borer deposits its egg under the bark, near the collar of the tree. The gum exuding from the wound is a pretty sure indication of the grub, which is easily cut out with a knife and destroyed. Wrapping the body of the tree with paper, or raising a mound of earth around the trunk, are both good preventives against the attacks of the borer.

"Ground mouse.—This insidious little depredator is all the better pleased with a deep snow, for then he has a secure and snug place in which to conduct his operations independent of cats and owls, his mortal foes. It is under the snow that he gnaws and nibbles the young tree until its trunk is completely denuded of bark within his reach. Last winter the writer had nursery trees destroyed on which the Downing preparation had been applied, showing conclusively that the ground mouse is not very fastidious, nor particularly nice about his diet. The main remedy is to clear away all harbors from around the tree, be it either trash, grass, weeds or snow. It is said that this little animal is much more troublesome in wet seasons than dry ones. Cold winters, with but little snow, are very prejudicial to them. At such times they are not very troublesome.

"The rabbit, or American hare, has, perhaps, done more mischief to young fruit trees than all other pests put together. He is the scourge of the nursery and young fruit orchard. To these he is the quintescence of mischief, the sum of all villainies. But we are all more or less sadly acquainted with his mischievous operations, and that which now most interests us is his riddance. "Catch 'em and kill em" is the stereotyped advice; but Mr. Rabbit is a firm believer in catching before hanging. Dogs do but little good. Shooting succeeds better. Traps much better still. A small hollow log, about three feet long, with a falling slide at one end suspended on buggers, with the other end closed and bated with apple, is the best form of trap I have tried. Poison, however, affords a more wholesome means of dealing with the rabbit. Drive a nail through a bit of board, and on the point of this impale half an apple, flat side up, with the poison spread on it, either strychnine or arsenic. Ten or a dozen of these baits put out of a night where the rabbits frequent, and repeated a few times, will completely rid the premises of the pest. Care must be taken to remove the poison every morning; bury it or burn it; keep it away from stock, and let the neighbors know what you are doing."

FRUIT REPORT.

Apples—As far as we have observed, is over an average crop. This noble fruit is beginning to occupy a situation as one of the great staple products of our section of the State. How delightful to see the regular, well-trained orchard, with its bright green foliage and spreading branches bending beneath their load of luscious fruit. There has been a large number of trees set within the last few years, and there seems to be a commendable zeal to have them well cared for. So the prospect of an abundance of fruit is very flattering. For varieties we refer to the list list made out by this society. (*See Fruit List.*)

Pears—Have done well this season—the *best we have seen for years.* Rostizer, Bloodgood and Brandywine for early, and Flemish Beauty, Bartlett and Louise Bonne d' Jersey for summer, followed by Belle Lucrative, Seckle and White Doy enne for fall, and Glout Morceau and Vicar of Winkfield for winter, have given very satisfactory results the past season. Fruit of good quality.

Peaches—Were an entire failure.

Cherries—All a failure, except Early May, of which there was a fine crop.

GRAPES.

As a general thing, the grape crop was good in our vicinity. However, where the most rain fell there was some appearance of rot. In dryer localities, the crop was mostly healthy. The demand for grapes is upon the increase, for as community learn the superlative excellence of this indispensable fruit, it will be consumed in proportion to the supply. It is a remarkable fact that a great many do not believe that the cultivated varieties are much better than the wild *natives*, and as they are sour and unpalatable, the same is expected of the sweet Delaware, the rich and luscious Concord, as well as the sprightly and vinous Catawba. To remedy this want of appreciation, a wise, intelligent and discriminating public has only to "taste and see," to be convinced of the good things in store for those that plant the vine. We will only speak of those that fell under our immediate notice, many of which will be referred to more for the purpose of *warning*, rather than commendation.

Adirondack.—This early grape of fine quality does not seem to succeed with us; mildews badly in the leaf. No fruit the past year, notwithstanding the vines were protected.

Herbemont.—Mildewed both in fruit and leaf. Though it occasionally produces some enormous specimens, it is evidently not at home in our climate.

White Muscadine.—This early amber-colored grape is of tolerable variety—perhaps the best of the Muscadine family. One of the best recommendations is its hanging so well on the vine. This variety should be in every collection.

Diana.—In our vicinity this variety rotted much worse than usual. This was, perhaps, induced by showery weather about the time they had arrived at their full size, but before they commenced ripening.

Dr. Brinckle.—This variety grew and in most respects resembled Isabella, but proved to be quite inferior to it. It is sour, and shrunk on the vine. One taste satisfied each visitor.

Concord.—Though in showery localities Concord rotted a little, yet enough remained to make a good crop. The vines were loaded with fruit that commanded the best prices of any of the productive varieties. This is the grape for everybody in Hendricks county.

Delaware.—Still holds an honorable position in the list of good grapes. It is a good bearer; often over bears, to the serious injury of the vine. It frequently requires thinning for the perfection of its fruit. Delaware is one of the best, quality to rule-

Marion.—This is the *meanest*, quality to rule, but for luxurience of growth is unsurpassed. *Worthless imposition.*

Clinton—Seemed to vie with Concord this year, as if anxious to redeem its former bad character. It never succeeded so well before. Thirty-six vines yielded a thousand pounds of merchantable grapes in one week.

Iona—Fruited for the first time in a small way, the quality of which was *par excellence;* but we must try it further in order to see whether it will bear *grapes.*

Rebecca—Bears about four to six ounces to the vine, of only fair quality; mildews in leaf.

Tokalon.—This far-famed grape had three whole berries and a few rotten ones on a vine four years old.

Northern Muscadine—Sound in foliage, and nearly so in fruit. Very much admired by some, and as much detested by others. Esteemed by some for its peculiar fragrance.

Dorr—Done well, hung well, cooks well, and looks well; hardy, sound in fruit and foliage, and deserving of further trial.

Isabella—On young vines seemed to succeed well, while on older ones it was generally a failure.

Tailor—Rotted badly; tender foliage.

Elsenboro—Did not succeed as well as heretofore—it set little or no fruit.

York Madeira—With its small sized bunch, but good sized berry, was rather sour to suit most palates.

Norton's Virginia—Had a few very fine bunches of grapes, but there was not enough bunches.

Alvey—Made a complete failure.

Venango—Rotted this season worse than usual.

Catawba—Ripened its fruit but imperfectly. The season is not quite long enough for it. When thoroughly ripened it is first rate.

Golden Clinton—Done better than heretofore, but at best it is scarcely worth the room it occupies, except to prove that a grape may get ripe and not be red!

Charter Oak.—This monstrous Pippin always commands attention by those that estimate quality by the way in which a grape occupies space.

Raspberries.—But few persons within our limits cultivating for market, but nearly all have a few for family use. Doolittle's, Black Cap and Philadelphia stand at the head of the list for this locality.

Blackberries.—There is not the attention paid to this fruit it deserves. The Lawton or New Rochelle is the only kind in cultivatton, except a few specimens of the Kitterting and Wilson's Early, which promise well.

Strawberries.—The cultivation of this luscious fruit is on the increase; now instead of a few patches we count by acres. Some cultivate in matted rows, some in hills. The hill system is fast gaining ground. As to varieties, the first with every cultivator in our knowledge is the Wilson's Albany. It has fully sustained the past season its former high character as an enormous bearer, and the solid, firm berry is very desirable for canning.

Agriculturist.—One year old plants produce some enormous specimens of very, fine fruit, but the second season the berries are small, irregular, and rather poor quality.

Russell—Done well where properly fertilized. The only inducement at all to cultivate this or the Agriculturist is they are later than the Wilson.

Austin.—The large, fine appearance of this berry brings it admirers; but it is too soft to carry to market; quality poor and insipid, though as it is very late in ripening, it is desirable to have a few.

Green Prolific—Gives good satssfaction in some situations; in others, and particularly where cultivated in matted rows, does very poor. It should always be cultivated in hills, which is the best in almost all varieties.

Lennig's White—Has not proved satisfactory on account of its shy bearing.

Mote.—This berry is very finely flavored and good size, but its rampant growth and great tendency to throw out runners makes it difficult to keep in hill, and does not make stools to amount to anything.

McAvoy Superior.—Early and excellent flavor and fair size, but rather shy bearer.

Iowa.—Very early and does till some better variety ripens. Profuse bearer, but small, and makes McAvoy's and other good varieties taste all the better after eating this poor little acid fruit.

French Seedling.—Rampant grower, good bearer, and although the berry is of pretty good flavor, it is too soft to carry to market.

Jucunda.—This large, fine berry has not been fruited by many of our members. It seems in most cases to be a poor grower, making small, weakly plants. The berry is large and makes a fine appearance, but lacks the solidity of Wilson's Albany, and not likely to supplant it.

MARION COUNTY HORTICULTURAL AND AGRICULTURAL SOCIETY.

The Marion County Agricultural and Horticultural Society held its annual Small Fruit Exhibition on June 19th and 20th, at Masonic Hall in the city of Indianapolis.

It was the best exhibition of small fruits ever held in this city, and those that have seen such exhibitions said it was as good as any they had ever witnessed before any place. The tables fairly groaned under the load of ripe, delicious strawberries. All the varieties grown in this and adjoining counties were on exhibition.

The following are the premiums awarded in the

PROFESSIONAL LIST:

Best 12 varieties Strawberries, H. Mankedick	$15 00
2d best 12 varieties strawberries, J. T. Francis	10 00
Best 10 varieties strawberries, J. T. Francis	10 00
2d best 10 varieties strawberries, H. Mankedick	5 00
Best 5 varieties strawberries, John Wineberger	8 00
2d best 5 varieties strawberries, J. T. Francis	4 00
Best 4 varieties strawberries, John Wineberger	5 00
2d best 4 varieties strawberries, J. T. Francis	3 00
Best 3 varieties strawberries, J. T. Francis	4 00
2d best 3 varieties strawberries, H. Mankedick	2 00
Best 2 varieties strawberries, J. W. Ragan	3 00
2d best 2 varieties strawberries, J. T. Francis	1 00

AMATEUR'S LIST—STRAWBERRIES.

Best 5 varieties, Sol. Blair	$ 8 00
2d best 5 varieties, J. S. Dunlop	4 00
Best 4 varieties, J. T. Wright	5 00
2d best 4 varieties, J. S. Dunlop	3 00
Best 3 varieties, J. S. Dunlop	4 00
Best 2 varieties, W. S. Hubbard	2 00
2d best 2 varieties, J. S. Dunlop	1 00

SWEEPSTAKES ON STRAWBERRIES—OPEN TO ALL.

Best variety for general cultivation, except Wilson's Albany,	
First premium, Sol. Blair	$18 00
Second premium, J. T. Francis	10 00
5 heaviest strawberries, J. T. Francis	5 00
5 largest string measure, J. T. Francis	5 00
Best seedling not heretofore exhibited, W. H. Latham	3 00

SPECIAL PREMIUMS ON STRAWBERRIES.

Best 1 quart Russell Prolific, John Wineberger	$ 5 00
Best 1 quart Wilson's Albany, J. T. Francis	5 00
Best 1 quart Golden Seeded, Sol. Blair	5 00
Best 1 quart 700 or Jucunda, Sol. Blair	5 00
Best 1 quart Fillmore, H. Mankedick	5 00
Best 1 quart Agriculturist, J. W. Ragan	5 00
Best 1 quart Elsworth, Sol. Blair	5 00
Best 1 quart Austin Seedling, J. T. Wright	5 00

CHERRIES, GOOSBERRIES, APPLES AND CURRENTS.

Best collection of Cherries, J. H. Vajen	$ 5 00
Best single variety of Cherries, J. H. Vajen	2 00
Best collection of Gooseberries, J. T. Wright	2 00
Best single variety of Gooseberries, John Burk	1 00
Best collection of Apples, W. S. Hubbard	3 00
Best 5 varieties of Currants, J. T. Francis	3 00

The Society held its fall exhibitions on the 25th, 26th and 27th of September 1867.

PROFESSIONAL LIST—FRUITS.

Best collection of Grapes, Dr. A. Furnas	$10 00

AMATEUR LIST—FRUIT.

Best 20 varieties of Apples, E. White	$15 00
Best 12 varieties of Apples, Charles Lowder	8 00
Best 6 varieties of Apples, J. H. Nichelson	5 00
Best 5 varieties of Fall Apples, D. M. Mills	5 00

PEARS.

Best 10 varieties of Pears, J. T Francis	$10 00
Best 5 varieties of Pears, J. S. Dunlop	5 00

GRAPES.

Best 5 varieties, (Diana, Delaware, Iowa, Concord and Isreala) John Wineberger	$15 00
Best 3 varieties (Concord, Hartford Prolific and Delaware), J. T. Francis	10 00
Best single variety, Concord, J. T. Francis	3 00
Best 5 clusters, any kind, John Wineberger	3 00
Best collection Grapes, John Wineberger	10 00
Best 12 Quinces, D. Mills	2 00

The officers for 1868 of the Marion County Agricultural and Horticultural Society are, J. S. Dunlop, President; D. V. Culley, H, Mankedick, J. H. Vajen, Vice Presidents; J. T. Francis, Secretary; W. S. Hubbard, Treasurer; D. V. Culley, Corresponding Secretary.

J. T. FRANCIS, *Secretary.*

RICHMOND HORTICULTURAL REPORTS.

Our Society still continues to prosper, and we find plenty of work to do. Each year developes something new and interesting in horticulture; something worthy of our attention; and we hope to still continue in the great work. Though a severe drought prevailed during the greater part of the summer, we were favored with an abundant crop of small fruit, and all was sold for a handsome profit to the grower.

There perhaps never was a better crop of grapes in this section of the State, the Concord proving the most profitable for the market. The Delaware never did so well. We trust it will continue in well doing, for there are none that can boast of greater excellence. Ten thousand bushels of peaches were shipped to this market the past season from Ohio, Southern Indiana and Illinois—the majority were from Warren and Butler counties, Ohio—the peach rarely ever proving a paying crop in Wayne county.

Our fruit growers are all making preparations to plant more extensively than ever before. The apple crop was almost a failure in this county the past season. The failure no doubt is attributable, in a great measure, to the long-continued cold in the spring, which compelled us to ship most of our supply from Henry county. Most of the counties laying south of Wayne shared a like fate, as well as southeastern Ohio. We feel in no wise discouraged on account of the failure of the apple crop this year. Every year develops the fact that the people want more fruit. Forty thousand dollars is a low estimate of the amount payed for fruits in Richmond in one year.

The officers elect for this year are: President, J. Mendenhall; Vice President W. L. Taylor; Recording Secretary, Sampson Boone; Corresponding Secretary, J. C. Ratliff; Treasurer, C. S. Mendenhall.

ALLEN COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

To the President and Members of the Indiana Horticultural Society:

The undersigned, Secretary of the Allen County Agricultural and Horticultural Society, would respectfully report that during the past year said Society has been in successful operation. A great and increasing interest is taken in horticulture.

The society now numbers over two hundred members, many of them being very active and efficient. The regular meetings of the Society are held every Saturday afternoon, at the Society's ample rooms, which are generally well attended. Lectures and essays are often read upon agriculture and horticulture, and discussions had upon almost all subjects connected with scientific and practical farming and horticulture. Much attention has been paid to fruit, its varieties and culture, particularly apples, pears, and the small fruits; wool and wool growing, and the best class of sheep to raise for wool or mutton, or wool and mutton combined; grapes and grape culture have not been neglected, several members of the society having vineyards, and after furnishing the home market with grapes, have made several hundred gallons of wine. The Concord perhaps stands first for growing in this region.

The society has annual fairs, which are generally well attended, and the display of fruits, flowers and vegetables often equals our State Fairs. The future prospects of the Society are encouraging, and its organization is on a permanent basis. The officers for the year 1868 are: President, Adam Link; Treasurer, S. J. Housh; Secretary, F. P. Randall.

MONROE ACRICULTURAL CLUB.

This Club has been in successful operation during the past year, and renewed interest seems to be manifested in horticulture and its kindred pursuits. Quite a number of additions have been made to our roll of members. We held two exhibitions during last summer. Heretofore it has been our policy to encourage an exhibtion of fruit and vegetables alone, but in our June exhibition stock raisers were invited, with a fair show. In September we held our fall exhibition, but, owing to the drouth, our show of vegetables was poor. Of apples there was a fine show, many collections ranging from 10 to 25 varieties. The stock department was well represented, and was a success, and will hereafter be one of our regular departments.

The spirit of improvement in horticultural and agricultural pursuits is steadily gaining, and we think the day is not far distant when we shall be able to show as fine fruits, &c., as any locality in the State. There are many fine orchards of old varieties of apples in bearing, and still larger ones of new varieties lately planted and not in full bearing. Fine marketable apples sold in the orchards at the season of gathering for twenty cents per bushel.

Our officers are: Solomon Hadley, President; J. H. Gayer, Recording Secretary; J. A. Taylor, Corresponding Secretary.

TERRE HAUTE HORTICULTURAL SOCIETY.

This Society has been in a prosperous condition during the past year. The meetings have been well attended, and much interest manifested.

The spring exhibition was held on the 12th and 13th of June—about two weeks later than usual, owing to the lateness of the season. It was a grand success. Never before had the Society been able to collect such a splendid array of fruits and flowers. One hundred and fifty-six entries were made and seventy premiums awarded, amounting to $177, which were in horticultural books and papers, and distributed among 25 families. We think that the circulation of these books and papers has been a great help to us, in exciting an interest in horticulture, and would advise all other Societies to follow the same policy.

Our fall exhibition was held in connection with our Agricultural Society. It was a few days late for a good display of grapes. The thermometer stood at 96 on both days. Flowers and vegetables were mostly burned up by the unprecedented drouth. We had, however, a very fair display, especially of green house plants.

The monthly meeting of the Society have been full of interest. Most of them have been held at private houses. The meetings begin at one o'clock, and the afternoon is spent in hearing reports and discussions. About dark a collation is served, and generally the evening is spent socially.

In regard to the fruit crop, we would say that all kinds, except tha strawberry, were badly injured by the drouth. The strawberries bloomed very full, but the frost on the 8th of May destroyed a great many—except in a few places where they had been well mulched, they were kept back and escaped the frost. We had a little more than half the usual crop.

In some parts of the county the apple crop was very good, though the fruit was small. In some orchards the crop was destroyed by the May frost, which caused most of the apples to drop. The codling moth has been very destructive to some orchards, and most of the apples are wormy and scabbed. Good apples sold in the fall readily at $1.00 per bushel. Grapes were badly injured by the frost; though, upon the whole, there was a fair crop.

Concords were generally healthy; some few rotted.

Some Hartfords withered on the bunch before ripening, but they generally were a good crop, and ripened well.

Delawares did remarkably well the past season. The vines were partially defoliated by the thrip, but the fruit was well ripened.

Clinton rotted slightly, and cracked some, but the crop was generally very good.

Catawbas rotted some, but in most of the vineyards they were unusually healthy In one vineyard of 23,000 vines there was scarcely a berry rotten.

Diana—about the same as Catawba.

Lawton Blackberries were generally injured by the winter and the drouth. One large patch hardly produced enough to pay for picking, while another small patch was overloaded with fine fruit.

Currants, Cherries and Gooseberries were a pretty fair crop.

(*See Apple List Terre Haute Horticultural Society.*)

The Organization of the Society for this year is as follows:

OFFICERS.

Hon. H. D. SCOTT, *President.*
SILAS PRICE, *Vice President.*
JOS. GILBERT, *Secretary.*
T. E. F. BARNES, *Treasurer.*

DIRECTORS.

H. D. Scott,
Sills Price,
Jos. Gilbert,
T. E. F. Barnes,
A. B. Pegg,
John G. Heinl,
W.m Patrick,
G. W. Edwards,
E. J. Brown.

STANDING COMMITTEES.

On Apples—Wm. Patrick, A. Pegg, S. H. McMurtrie.

On Grapes—J. F. Soule, Jos. Gilbert, P. H. Monigher.

On Strawberris—Lorenz Heinl, A. B. Pegg, G. W. Edwards, H. D. Scott, Jos. Gilbert.

On Other Fruits—Silas Price, E. F. Brown, G. W. Shaffer, Ed. Haas, J. F. Soule.

On Vegetables—G. H. Whidden, Silas Price, G. L. Biegler.

On Potatoes—Jos. Gilbert, E. J. Brown, J. D. Parker.

On Flowers—John G. Heinl, Mrs. H. D. Scott, Mrs. M. Madrigal.

On Birds and Insects—G. W. Shaffer, Wm. Scholz, Wm. Patrick.

On Cooking, Preparing and Preserving Horticultural Products—Mrs. J. F. Soule, Mrs. A. B. Pegg, Mrs. Corey Barbour, Mrs. Wm. Patrick, Mrs. John Weir, Mrs. G. W. Shaffer.

Regular monthly meetings the first Saturday of each month at 1 o'clock P. M. Members of other societies are cordially invited to attend the meetings.

VIGO AGRICULTURAL SOCIETY.

(*Organized in* 1866.)

They have a beautiful Fair Ground, containing seventy-five acres, upon which the State Fair was held last year. It is held by a stock company, and is in a flourishing condition. They intend to give the Horticultural Department its full share of attention. They will hold their Annual Fair on the 22d, 23d, 24th, 25th, and 26th of September, 1868, and have appropriated over $3,000 for premiums, payable in money.

OFICERS FOR 1868.

C. W. BARBOUR, *President.*
HIRAM SMITH, *Vice President.*
JOS. GILBERT, *Secretary.*
A. B. PEGG, *Treasarer.*

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HARRISON TOWNSHIP FARMERS' AND FRUIT-GROWERS' CLUB.

Vigo County, Indiana. Organized January 6, 1868.

OFFICERS.

J. F. SOULE, *President.*
G H. WHIDDEN, *Vice President.*
A. HOSIER, *Treasurer.*
JNO. G. HEINL, *Secretary.*

The Committee on Implements, &c., made the following report:

To the President and Members of the State Horticultural Society:

We, the Committee on Machinery, beg leave to make the following report:

That we have examined J. R. Boswell's Fruit Dryer and Room Heater, and pronounce it a labor-saving machine, and recommend it to the Society as such.

We also examined the Cider Press of Wm. H. Ragan, and recommend it to the attention of fruit raisers—a description of which here follows:

AMOS ALDERSON,
MERCER BROWN,
T. B. MORRIS,
Committee.

RAGAN'S CIDER AND WINE PRESS.

This machine consists of two upright posts, supporting a strong cross beam, in the center of which is fixed a nut, through which the screw works. Below this is another light beam, with a collar in the center, through which the lower end of the screw, which is smooth, and might be termed a plunger, works. On the lower end of the plunger is fixed a follower, made fast by set-screws working in the neck, on the same. At the lower end of the threaded part of the screw, and in the middle of the shaft, is fixed a spur wheel, working in the space between the two beams, and engaging in an elongated pinion, the length of this space, which allows this wheel to play up or down, as the screw carries it. This pinion is driven by a bevel gearing attached to the lower end of its shaft, which is operated by a crank. This gearing is simple, and so multiplied by back gearing, that the operator has a leverage equal to six times the length of crank. Under the screw is an inclined bottom extending out to one side, upon which four ribs or rails are placed, with their upper surfaces level. On these, false bottoms slide. One of these is dropped on the extending platform, where the work of preparing a cheese for pressing is done, entirely out of the way of the press, and at the same time that the press is in operation. When ready for the press, this is readily run under the screw, when the work of pressing goes on. Whilst this cheese is in press, another one is preparing on the other false bottom. The whole is very simple and cheap, and occupies but little space.

REPORT OF FRUIT COMMITTEE.

The committee appointed to examine the fruit on the tables respectfully beg leave to submit, in brief, the following report: First, that the exhibition was perhaps never better, on any former occasion, proving, conclusively, that the last season was not only favorable for apples, but also that an increasing interest is manifested in the cultivation of this noble and healthful fruit.

Your committee is also gratified to be able to note the fact that the nomenclature of our fruits is slowly, but gradually approaching to something like perfection, thus relieving the fruit grower of the endless perplexity arising from the incorrect names that are still too often apparent in our country. To enumerate all the varieties on the tables would be a work requiring much more time than is at their disposal at present, and as a matter of course your committee will necessarily have to be very brief in their notices of varieties.

In two of the collections, if no more, the aid of the fruit house has been brought to bear in furnishing varieties out of season. Thus the earliest varieties of apples, as well as the longest keeping varieties, are arranged in our collections side by side, with all the intermediate varieties, enabling us to compare the Yellow June and other apples of like season with the quality of our longest keeping apples.

J. S. Jessup, of Laporte, Indiana, shows sixteen varieties; all good—some very nice Domenies, fine Baldwins, etc. This collection shows the necessity of classifying the State in different sections, as many of these would not succeed in the south part of the State. We find some Russets here, the names of which would convey very little idea of what they really are.

John A. Mendenhall, of Richmond, Indiana, exhibits an apple as Yellow Vandervere, which appears to the committee to be the old Vandover Pippin. This small collection embraces some good varieties.

The Messrs. Ragan, of Putnam County, exhibit forty-seven varieties collected from the farmers of that county. All of which are very well arranged and appear to very good advantage. A few new varieties are worthy of interest, among which are Sweet Jannet and Red Russet. The former from Reuben Ragan, and the latter from Exter, Maine. Norton's Melon and a great many other leading valuable and popular varieties.

Plainfield Horticultural Society—Here we have about forty-five varieties of apples of that vicinity, showing the excellence of that region to apple growing. Some of this collection had been stored in a cellar with some substance or article of which they had absorbed enough to injure their flavor. This should be a warning to storing fruit in cellars with such offensive substances that can deteriously effect the quality by absorption. Rotten cabbage, potatoes, and straw infect most. Decaying substances, or anything that emits an unpleasant odor should not be allowed in the cellar where apples are kept.

J. C. Shoemaker, of Perry County, exhibits a few varieties of apples of unequaled size and beauty. His Rome Beauties and Ben Davis are certainly very fine. The apple, as well as most other fruits, certainly succeeds well with him.

Allen County—Mere reporting in writing fails utterly to convey an idea of this magnificent display. We find forty-one named varieties of apples, besides several without name, and eight or ten varieties of pears. These apples, for quality, size, and coloring, certainly appear to the best advantage. And in point of commercial value and general substantial utility, the committee are unanimous that they should have the preference above all others on exhibition.

Lewis Jones, an old veteran, after an absence of a few years, is again with us, and notwithstanding the society was deeply engaged in business upon his entrance into the room, yet he was warmly and cordially welcomed. He then commenced arranging his extensive collection in which he furnished us with a list of seventy-six varieties of apples, and exhibited about twenty kinds without name. His exhibition runs from the earliest to the latest kinds, and is the work of no mean insignificance. This collection, taken as a whole, is of peculiar interest, showing as it does, a collection from Western Ohio and Eastern Indiana, extending perhaps from fifty to seventy-five miles from North to South, and the same distance from East to West.

Dr. Warder, of Cincinnati, showed a collection of pears and apples, most of which were new to us, and the Doctor's absence prevented him from giving the committee an explanation in reference to it, and hence the committee is unable to do it justice.

Andrew Wallace, of Indianapolis, showed some very fine pears; also, some fine grapes—showing conclusively that this luxury is within the reach of every one who will put forth his hand for this indispensable health-giving luxury.

William Patrick, of Terre Haute, exhibits eight varieties of apples, all fine and nice, and fair representatives of the rich prairies of the Western States.

Mr. Wineberger, of Indianapolis, also exhibited several very fine varieties of grapes—all of which are quite creditable to the producer.

On motion, E. Y. Teas, W. Patrick, and Dr. Bland were appointed delegates to the State Horticultural Society of Missouri, to be held on the 14th instant.

On motion of Dr. Furnas, the following resolution was unanimously adopted:

Resolved, That the thanks of this society be tendered to Dr. T. A. Bland for his untiring industry in his labors in our last legislature, in procuring the passage of the appropriation granting this society $500 for publication of our annual report.

The subject of Grapes was then taken up for discussion.

Dr. Furnas said there was some indication of rot on the Concord, there coming a black spot just under the skin, which caused them to fall off. This lasted but a few days, but did no injury, for they made a most magnificent crop.

The Delaware did remarkably well—the most difficulty being in overbearing.

The Diana did not do so well.

The Dorr bears well, remarkably hardy, and hangs long on the vine, and dries up sweet and nice.

The Clinton had done well this year; said the thrips did not appear this year.

The York Maderia done pretty well this year.

Norton's Virginia, so much spoken of, does not bear sufficiently with me.

The Adarondac has not fruited well.

The Marion is the meanest thing—a rampant grower, but very little fruit and that worthless.

He has forty varieties of grapes, of which six would do to hitch to:

William H. Ragan said he saw the Adarondac nicely colored the 2d of August, at Washington. He saw some at Greencastle that looked well.

Mr. Randall, of Fort Wayne, said the Catawba ripened perfectly this year.

The Concord did well, no disease of either vine or fruit.

Had tried some experiments in wine. Picked a bushel of Catawba, (in bunch) which weighed forty pounds. One-half bushel picked off weighed thirty pounds, and when mashed and pressed, made twenty-two pounds of juice and eight pounds of seed. Had very little rain, none while they were ripening, which caused them to be very perfect berries.

W. H. Ragan, of Fillmore, said his father, Reuben Ragan, never had better success than during the last year.

The Delaware was remarkably fine.

The same could be said of the Concord, no disease the last year.

J. S. Dunlop, of Indianapolis, has more grapes from Catawba than any other variety. Thinks no other grape equal for wine. For eating, thinks nothing equal to the Delaware.

Has some Iona—no fruit yet, vines healthy.

Ives' Seedling a fine, healthy grower; no fruit yet.

J. C. Nicholson says he looses a crop of Catawba once in five years. The other four years good crop.

The discussion here turned on the Strawberry.

Dr. Furnas has never planted to raise berries to make money—sells the surplus. When the people learn to eat Strawberries, and the price is reasonable—at such figures as all can afford to eat them—we will not lack for market

Spoke highly of the Green Prolific, good bearer and remarkably hardy.

William Patrick, of Terre Haute, liked the Green Prolific— a hardy and good bearer, but Wilson's Albany was *the* berry.

Spoke highly of mulching lightly, so as to shade the plants. One ton of straw was enough for an acre.

J. T. Francis, of Indianapolis, said he had abandoned mulching. Thought it entirely unnecessary.

J. S. Dunlop, of Indianapolis, considered it necessary to mulch. Had sowed oats in the fall, it grew up, the frost killed it, when it fell down and made a fine mulch.

M. L. Dunlop, of Illinois, said in Illinois mulching was an absolute necessity.

The discussion continued at some length, many having their favorites for flavor, etc., but which resulted in the conclusion that Wilson's Albany was the best for general use and for market.

A rambling discussion on Blackberries ensued, in which the Wilson Early was highly spoken of on account of its fine appearance, earliness, and for its very abundant bearing.

Adjourned till half past one o'clock P. M.

AFTERNOON SESSION—THURSDAY.

The subject of insects and vermin was then taken up.

M. L. Dunlop, of Illinois, said they had one bug, (the new potatoe bug commonly called the ten-line spearmen,) there, which is traveling in this direction, and would be over here next year. They had deprived thousands in his State of food, by entirely destroying the potatoe crop. The price of good crops is vigilance, and in order to stop their ravages take them off and kill them on their first appearance, and wherever this precaution has been taken there is not much trouble. Had seen men save their whole crop by this precaution. Just before the blossom appears look sharp and kill all that appear. There is no bug that can gormandize as these do, and so great is their fecundity, that one hundred to-day are ten thousand to-morrow.

Insects have each his territory (except as this one is "imported,") which do nearly as well in one section as another. It is difficult for a common farmer to give this subject his study, and we want to learn them all.

Our State Society of Illinois used all our efforts till we got the Legislature to appoint a State Entomologist to make these things his study, and give information for the public. He commenced his operations by correcting a belief that root grafting was wrong, and made short-lived trees, for some of the societies in the South part of the State had settled that root grafting would not do. He, (Dunlop) had told them that it was the root louse that caused the difficulty, but they would not believe it. But when the State Entomologist come to examine the matter, he being a disinterested party, he convinced them that this was the cause. They destroy the tree while young, or when just coming into bearing. The tree that has the habit of sending down its roots deep in the ground is not injured by this pest, and they do not hurt old trees. They are small and cannot be seen by the natural eye. He believed in giving these investigations to a practical entomologist who can make it his sole study.

He spoke of the curculio, and said if we take an inverted umbrella fixed on a wheelbarrow, so that there is an opening on one side to receive the tree, hit the tree with the wheelbarrow and jar them down, a man could go from tree to tree very rapidly, and it would not take long to jar a hundred trees.

He said mice would not interrupt trees if the ground was kept clean of trash around them. Rabbits do not damage trees much, as arrangements are made with the boys for a general hunt occasionally and kill most of them, or the trees are protected in a way that rabbits cannot get at them, which also protects them from the cold.

A. Jones, of Plainfield, said a neighbor of his washed his trees with a mixture of cream and assefetida with success.

Dr. Warder said that blood was one of the best preventatives. Take a bucket of blood, and a whisp of cornhusk tied to one end of a stick, and a man could sprinkle the trees even of a nursery very rapidly.

The Doctor spoke at considerable length on the different insects that infest our trees and plants, which was very interesting and instructive, but we were not able to make a detailed report.

Dr. T. A. Bland wished some light upon a question that had been raised. In his paper, the *North-Western Farmer*, he had spoken of the mole as a friend to the farmer, and had been besieged with communications taking the opposite view.

Dr. Warder remarked we had only to take a potatoe that had been nibbled, and a mole, put them side by side, to establish his position. The teeth marks are not those of the mole, while the animal will contain grubs and worms.

S. W. Pearson wished to know why it was that a row of peach-pits would be destroyed so frequently, while a mole hole run along directly under them?

Dr. Warder said this was a hard question to explain. The short tail field mouse will cut grain, and follow along through the mole holes.

William Patrick, of Terre Haute, had left a quart of peach-stone pits on the ground a short time, and returning found most of them gone, and a mole hole directly under them.

J. H. Vajen had put a mole in a box of earth and corn; feeding him on insects and bugs he lived well, but confining to corn diet, he died in a few days.

Fielding Beeler had noticed the same results in the corn fields that Mr. Pearson had in the nursery—every grain in the line of a mole hole being destroyed.

M. L. Dunlop, of Illinois, was satisfied the mole lived upon grubs and insects rather than grain, and that it was the friend of the farmer.

Many present were exceedingly skeptical upon this point, and a strong hostility against the mole was generally expressed.

The Delegates to the United States Pomological Society report as follows:

REPORT OF THE DELEGATES TO THE MEETING OF BIENNIAL SESSION OF THE NATIONAL POMOLOGICAL SOCIETY, WHICH MET AT SAINT LOUIS, MISSOURI, IN SEPTEMBER, 1867.

The undersigned, three of the Delegates appointed by this Society to attend the National Pomological Meeting at Saint Louis, in September, 1867, submit the following report:

No attempt will be made to give a full description of *pomonal gifts* as exhibited at this National Meeting and Exhibition. First, because no description we could give in this report would do justice to the display; and, second, because no special benefit could be derived from it to this Society. It is enough to say, that as a whole, it was a grand success—no department of pomology was neglected. It was not a mere collection or two from local points to fill up, as is sometimes necessarily the case, but the number of exhibitors from all sections of the United States, and the amount of fruit exhibited, was absolutely bewildering to those anxious to take notes and make comparisons. Although the season was considered an exceedingly dry one throughout most sections of the country, and which amounted to a drouth almost without a parallel in the entire Western States, still it did not prevent the development of fruit so as to mar the general display. Indeed, we did not see anything that looked like a failure of the fruit crop anywhere, while complaints are made in all sections where the drouth prevailed of the disastrous failure of the grain crop from that cause. So that we may, upon the whole, consider the fruit crop less liable to be effected by the extreme drouths that so frequently prevail in our country, than any of the grain crops; and, therefore, looking at it merely from a commercial stand-point, we have abundant and increasing reasons to be hopeful and to urge on the enterprize with more and more vigor.

In making a slight reference to the fruit on exhibition, it is but justice to say that the most attractive display was of peaches, which were abundant in quantity, of enormous size, and of surpassing beauty and excellence. The specimens were from different sections, but chiefly from that portion of Illinois commonly known as "Egypt," and the adjacent sections of Missouri.

But the grape was evidently the hobby that most persons came there to ride, as appeared by the quantity and excellence of the fruit, and the *prices thereof*, as well as the time occupied in the discussion of the grape and wine question. Scarcely a word could be wedged in on any other subject, so intense was the anxiety to ventilate this *one-idea* fruit question. While the apple, everybody's fruit, as well as the great and important fruit of Commerce, that is, and can be proven throughout the entire extent of our country, was almost wholly ignored. Just at the close, however, one of the members of this committee offered the poor compliment of a resolution, which was adopted, asking for forgiveness for the apparent neglect, for want of time to consider so important a subject. This being the great staple fruit of Indiana, we felt more interest in the discussion of apples than grapes; but as the meeting was held in the great grape growing region of America, that subject was entitled to most of the time of the meeting in its discussion. The committee are gratified to report in this connection, that the apples grown in Indiana are in no respect surpassed by those grown elsewhere in the United States.

The pears exhibited were beautiful to look upon and excellent in taste. Colonel Wilder, of Boston, the veteran pomologist and President of the Society, exhibited a very large collection, as did also Messrs. Ellwanger & Barry of Rochester, New York. Many other exhibitors, from different sections of the country, furnished a large number of beautiful specimens; but it was apparent to all that the pear is not so much at home in the West as in the Eastern States. Western fruits excelled in every other department. But the terrible blight is pursuing its victim everywhere, and unless it can be arrested in its progress, it will discourage the future cultivation of that delicious fruit. Thomas Muhan, editor of the *Gardener's Monthly*, Philadelphia, delivered a highly interesting lecture upon that subject, advancing some new ideas. It will be published with the transactions of the Society.

This meeting of pomologists at Saint Louis, was a highly interesting one on many accounts, especially in the great array of horticultural talent, which was, perhaps, never surpassed in any assembly of the kind. The discussions throughout were highly interesting, evincing a thorough knowledge of all matters under consideration

Saint Louis is surrounded with a fine fruit country, and much horticultural taste is exhibited. Your delegates availed themselves of opportunities of visiting places of horticultural interest, the chief of which was a visit to the vine-clad hills of Herman, about eighty miles up the Missouri. Lafayette Park, in the city of Saint Louis, which is just being fitted up at an expense of $10,000 or $15,000 a year. It is for pedestrians, and under the present management is likely to be made quite attractive. Its extent is about thirty acres.

We also accepted an invitation to visit, at any time during our stay, the Missouri Botanic Garden, of Henry Shaw, Esq., just out of the limits of the city. Mr. Shaw is an English gentleman of refined taste, who has lived in Saint Louis since his boyhood, where he came poor, but has amassed a fortune in business, and now lives in ease and elegance. On our arrival as his place, we saw the flag flying from the tower—a sign that the "Duke is at home"—we found him one of the most genial, comfortable feeling men that could be wished for, (a thing by the way, however, quite common among horticulturists,) and felt ourselves at once quite at home. We had but little time to spare. He accompanied us as far as possible through his green houses and over his grounds generally, which we sum up in part, briefly, from recollection. There were a number of green houses, and a palm house in process of construction. An extended fruit garden of six or eight acres for the purpose of testing all the various kinds of fruit, particularly such as have not proved entirely adapted to our climate. An arboretum containing some twenty acres where specimens of all the conifera and other shrubs are grown. He has nearly thirty varieties of the pine family alone. Besides his residence he has a building constructed for the purpose of a museum and botanic library, with a reading and lecture room below. All of which was constructed by him, and is kept up entirely at his own personal expense, free to all visitors at all times except on Sundays. An individual enterprize of unexampled liberality by anything in the United States. What the cost of the whole is, we did not understand from others, and did not of course ask him, although he intimated to us that he expected to bequeath it to the city at his death, with such further endowment as will keep it up and have it remain perpetually. Mr. Shaw, although not young, is not a very old man and may live many years. Our visit to Herman was more of a pomological character. It was upon the invitation of George Hussen, Esq., the well known wine grower of Missouri. The Pacific Railroad Company placed as many cars at our disposal as would be required to take every member of the Convention to and from Herman, free. Of course a large number went, and the visit was a delightful one. Herman is certainly German all over. The cultivation of the vine appears to be the chief occupation of the citizens. All varieties of grapes are cultivated to a greater or less extent. Those that are considered to make the most and best wine are the most extensively cultivated. These appeared to be the Concord, Norton's Virginia, Herbemont, and Catawba. The latter appears to be on the decline. Peaches grow in the greatest perfection in this vicinity. Hundreds of bushels of the finest varieties and as beautiful specimens as the eye ever beheld, were scattered around the ground in the greatest profusion. Beautiful specimens of apples and pears could be see in any of the orchards of Herman, leaving the impression on the minds of your delegates that the banks of the Missouri, this far from Saint Louis, at least, is admirably adapted to fruit growing.

The interests in fruit growing is greatly on the increase in all sections of the United States, and nowhere can it be more profitably done perhaps than in our own State. That we are behind most of our sister States in this regard, is quite manifest to us in view of what we saw during our visit and attendance at the Convention. We take occasion therefore to urge all fruit growers in our State to greater efforts in seeing to it that our State takes the horticultural position she so justly deserves.

I. D. G. Nelson,
John C. Teas,
Joseph Gilbert.

The Committee on Wine and Canned Fruit reported as follows:

REPORT ON WINES AND CANNED FRUIT.

Several parties exhibited Wines of fair quality, but none appeared to the committee to be superior. Of Canned Fruits, there were two exhibitors only—Lewis Jones, of Wayne County, and William Patrick, of Terre Haute. Each of these had on exhibition very superior specimens of Canned Peaches. A glass jar of Crawford's Early, shown by Mr. Patrick, was, in the opinion of the committee, the best they had seen in the way of Canned Fruit.

I. D. G. Nelson, of Fort Wayne, and Wood & Boyd, of Indianapolis, exhibited specimens of Vinegar of good quality. Nelson's were regarded very superior. There were also on exhibition, some very fine specimens of early Goodrich, Harrison, and other new varieties of potatoes, shown by I. D. G. Nelson, of Fort Wayne.

Respectfully submitted,

John A. Worden,
M. L. Dunlop,
T. A. Bland,
Committee.

The Society then adjourned to meet at the call of the *ad interim* committee, they to designate the time and place for the semi-annual meeting.

CALLED MEETING.

At a called meeting of the Indiana State Horticultural Society, held at Salem, Washington County, August 13th and 14th, 1867, to consider the subject of Peaches, A. Furnas, Vice-President, in the chair. In the absence of the Secretary, Abraham Trueblood was appointed Secretary *pro tem.*

Considering the lateness and dryness of the season, there was quite a respectable show of fruit on the tables. The principal exhibitors were Dr. Prather, William B. Lipses, F. C. Johnson, of New Albany, A. Furnas, Francis Trueblood, H. Callaway, and I. Johnson.

The first introduced for consideration was Hal's Early, a few imperfect specimens shown by W. B. Lipses, quite out of season, tree healthy, good bearer; ripening season longer than is usual.

Second—Large Early York, in most of the collections, was acknowledged by all to be a moderate, regular bearer, of very fine fruit; inclined to rot before maturing.

Third—Honest John, good bearer, tree healthy, not liable to winter-kill; good for market.

Fourth—Yellow Alberge, tree hardy and good bearer, of very fine fruit, but too tender for a market peach.

Fifth—Early Nevington, good bearer, fruit very large and firm; good for market only.

Sixth—Crawford's Early, fruit very fine, but a shy bearer; not so profitable as some others on that account.

Seventh—Yellow Roseripe, freestone, pretty good beaaer, dry and firm; good for shipping.

Eighth—Windsor Seedling, freestone, a profuse bearer, tree hardy, fruit small and requires thinning to make the fruit saleable, very profitable.

Ninth—Old Nixon, freestone, a shy bearer, but very fine peach for market.

Tenth—Old Mixon, cling, good bearer, number one peach for family and market.

Eleventh—Davis Early, cling, a profuse bearer, of medium size, and good for market.

Twelfth—Gross Mignonne, acknowledged as number one by all.

Thirteenth—White Sweet Water, new, promises well, fruit of the best quality; too tender for market.

Fourteenth—Huffman Favorite, freestone, over medium size, of the very best quality; too soft when ripe to bear shipping.

The following varieties of Plums were exhibited by F. C. Johnson, of New Albany: Duane's Purple, Green Gage, and Chickasaw. And by Samuel Trueblood, what is known here as the Little Blue Damson, a regular profuse bearer; the only variety that is exempt from the curculio, consequently the only one that we deem worthy a place in our orchard.

Of the apples on exhibition, the following were noted:

First—Golden Sweeting, a profuse bearer, of very fine fruit: good for market.

Second—Summer Russet, of the best quality, but a very shy bearer, hence not profitable.

Third—Trenton Early, one of the best early apples.

Fourth—Finley, formerly among the best, but not doing so well now; poor bearer.

Fifth—Summer Queen, fair specimens; well spoken of by all who have tried it.

Sixth—Horse Apple, tree remarkably healthy, and uniformly a good bearer.

Seventh—Red Stripe, Primate, and Yellow June presented by F. C. Johnson, of New Albany, are recommended as good bearers.

The Society then adjourned.

CALLED MEETING.

At a called meeting of the State Horticultural Society, held at the Court House in Terre Haute, October 2d, 1867, President I. D. G. Nelson in the chair, the subject of the fruit crop was taken up.

Charles Lowder said in Hendricks County the fruit was better than usual; the winter apples were falling off badly; the fruit is not quite so large, nor is it so much effected with the scab as usual. No peaches this season; grapes good, rotted some in July, only lasted a few days.

J. C. Shoemaker, of Perry County, said the fruit in that part of the State was above an average; peaches good, grapes fine, winter apples falling badly; of peaches, they considered Hale's Early, Troth's Early, and Crawford's Early the best varieties; Concord grape does well.

Mr. Williams, of Knox County, said apples were falling badly, and rotting some. Pears very few, grapes raised in sandy soil, doing well.

Mr. Donaldson, of Parke County, said the orchards were full and the fruit dropping off some; but few pears, very few grapes, but doing pretty well.

President Nelson said he had suffered much injury by worms in his apples. No case of cholera had appeared among the hogs where they had been allowed to run in the orchard. The fruit crop was never better; he had adopted the plan of having the apples all picked up as soon as they fell, not let them remain on the ground a single day, and make all into vinegar, which pays better than selling the apples. He gave a short account of his manner of making vinegar, which, at the request of the Secretary, he furnished. (See appendix.) He, (Nelson,) said the fruit crop in Northern Indiana was the finest he had ever seen. The grape crop was good, particularly the Delaware, which had redeemed its high character. A a dry season is best for fruit. Corn crop good where well tended and the ground kept loose, which will hold good in all crops of grain or fruit. Thorough cultivation is the secret of success.

A. D. Hamrick, of Putnam County, President of the State Board of Agriculture, said they had a good soil for fruit. The sandstone soils were well adapted to peaches, and they generally succeeded. On the limestone, peaches did not do so well; apples did better. The apple crop was good this season, though some were falling.

D McMillin, President of the Ohio State Board of Agriculture, said the peach crop was pretty good all over that State; the apple crop was not so good—in Green County there were very few. He spoke of mounding up around their trees. Said there was a gentleman in Warren County, who had obtained a patent for mounding around trees, particularly peach trees, by which means he had succeeded in raising good crops of that delicious fruit. He adds a little every year, until the dirt is heaped up around the limbs. His trees are vigorous and healthy.

Mr. McMillin said he protected his trees from mice by mounding up around them—mounding leached ashes around them answers the same purpose, and is good for the tree.

E. T. Cox, of Posey County, said they had the reputation of raising nothing but hoop-poles, but that they had very fine peaches, good pears, and this year an excellent crop of cherries. He thought the success in peaches, as spoken by Mr. Hamrick, was owing, in a great measure, to the exposure. Thought the quality of the soil had a great deal to do with the quality of the fruit. Grapes were generally good—Concord and Delaware very fine, Catawba very good. The crops where thoroughly tended were good.

A. D. Hamrick asked what was best to do with winter apples that were falling off. He had some picked, and asked the propriety of that course.

The President said his experience was, that apples picked early, kept better, though not quite so good. An apple should remain on the tree as long as it can, but if falling badly, they had better be picked. Some varieties require picking much earlier than others.

Charles Lowder said he had noticed on trees that were unusually full of bloom, the fruit dropped off. Where the fruit is hard to pull off, it is not ripe, and the quality will not be so good if picked, but if it comes off easy, it should be picked at once.

J. C. Shoemaker, of Perry County, said he classed the Yellow Belleflower, Fall Queen, and Northern Spy as fall apples. Considered the Janet, Winesap, Smith's Cider, Ben Davis, and Rome Beauty, their best winter apples for market.

The President said the Yellow Belleflower was variable on different soils.

J. C. Shoemaker spoke very highly of Hays' Wine, little later than the Rambo, three times as large, and equally as rich in flavor.

The President said he despaired of finding an apple that would not be effected by worms.

J. C. Shoemaker said it depended on the quality of the apple. Where the quality of the apple was good, the worms will appear, and will not be found on those of a poor quality. They will not hurt Campfield where the Ben Davis can be found.

Dr. Bland asked if any one knew anything particularly of the Ives' Seedling grape. Said he attended the Horticultural Exhibition at Cincinnati, last week; the wine of this grape sold high, and was of extra quality. Colonel Thompson, President of the Winegrowers Association, spoke remarkably high of the Ives' Seedling.

The President said it was and old variety, and was working its way into public favor.

Adjourned.

FRUIT LIST.

Explanation.—N., Northern Indiana; C., Central Indiana; S., Southern Indiana. In the Season column, S. stands for Summer, A. for Autumn, W. for Winter, E. for Early, L. Late. In the N., C. and S. column, three dots (...) denotes that the variety is unknown, or not fully tested; a dash (—), that it is known, but not approved; a star (*), that it is generally approved; two stars (**), much approved, or popular; a dash and star (—*), that it does well in some localities only. In the Strawberry Class column, S. denotes that the blossom of the variety is Staminate, or self-impregnating; P. stands for Pistillate.

APPLES.

Name.	Class.	Color.	Season.	Size.	N.	C.	S.
American Golden Russett	Acid	P. russ.	E. W.	Medium	*	*	*
American Summer Pearmain	S. acid	Striped	L. S.	Large	*	*	*
Astrachan Red	Acid	Red	S.	Large	*	*	*
Autumn Seek-no-further	S. acid	Striped	A.	Medium	...	*	...
Autumnal Swaar	Sweet	Yellow	A.	Large	*	...	...
Baily Sweet	Sweet	Striped	W.	Large	*	...	...
Baldwin	Acid	Striped	W.	Large	*	*	—
Belleflower, yellow	Acid	Yellow	E. W.	Large	*	*	*
Belmont	Acid	Yellow	E. W.	Large	*	**	*
Benoni	S. acid	Striped	L. S.	Medium	—	*	*
Ben Davis	Acid	Striped	W.	Large	**	**	**
Broadwell	Sweet	Yellow	W.	Large	...	*	...
Buckingham	S. acid	Striped	A.	Large	...	*	**
Carolina Red June	Acid	Red	E. S.	Small	—	*	*
Campfield	Sweet	Blushed	L. W.	Medium	*	*	*
Canada Reinett	Acid	Yellow	W.	Large	—*	...	...
Cooper	S. acid	Striped	A.	Large	*	*	...
Cooper's Market	S. acid	Striped	W.	Medium	...	...	...
Dominic	S. acid	Striped	W.	Large	—*	*	...
Daniel	S. acid	Striped	E. S.	Small	*	*	...
Duchess of Oldenburg	Acid	Striped	S.	Medium	**	...	...
Early Harvest	Acid	P. yel.	S.	Medium	*	**	*
Early Pennock	Acid	Striped	S.	Large	—	*	...
Early Joe	S. acid	Striped	S.	Small	*	*	...
Early Strawberry	S. acid	Striped	S.	Small	—*	...	**
English Golden Russet	Acid	Russet	W.	Medium	—*	—*	*
Evening Party	S. acid	Striped	W.	Small	*	...	...
Fallawater	Sweet	Blushed	E. W.	Large	*	**	**
Fall Orange	Acid	Yellow	A.	Large	*	...	...
Fall Pippin	Acid	Yellow	A.	V. large	*	*	**
Fall Wine	S. acid	R. str.	A.	Medium	*	**	**
Fameuse	S. acid	Striped	A.	Medium	*	*	*
Fenley	Acid	Yellow	S.	Large	...	...	*
Fulton	Acid	Bls. yel.	W.	Large	*	*	...
Gilpin	Sweet	R. str.	L. W.	Small	—	*	*
Golden Sweeting	Sweet	Yellow	S.	Large	**	**	**
Gravenstein	Acid	Striped	S.	Large	*	—*	...
Hagloe	Acid	Striped	S.	Large	...	*	—
Hoops	Acid	Striped	L. W.	Medium	...	*	*
High-top Sweeting	Sweet	Green	S.	Medium	*	*	*
Hubardson Nonesuch	Acid	Striped	E. W.	Large	—*	*	...
Indiana Favorite	S. acid	Striped	W.	Medium	...	**	...

APPLES—CONTINUED.

NAME.	Class.	Color.	Season.	Size.	N.	C.	S.
Jersey Black	S. acid	Drk Red	W	Medium	**	**	**
Jerminite	S. acid	Striped	L. W	Medium	...	*	...
Jersey Sweet	Sweet	Striped	S	Medium	*	*	*
Sonathan	Acid	R. str	W	Medium	*	*	*
Keswick Codlin	Acid	Yellow	S	Medium	**	*	*
King of Tompkins County	S. acid	Striped	W	Large	*	*	*
Large Yellow Bough	Sweet	P. yel	S	Large	*	*	*
Ladies Sweeting	Sweet	Striped	W	Large	*	...	...
Late Strawberry	S. acid	Striped	A.	Medium	*	...	...
London Sweet	Sweet	P. yel	W	Large	*	...	...
Lowell	S. ocid	Yellow	A.	Large	*	*	...
Maiden Blush	Acid	Y. Blsh	A.	Large	**	**	**
McAfee None-such	Acid	Striped	W	Large	...	*	...
Melon	S. acid	Striped	E. W	Large	*	*	...
Milam	S. acid	R. str	W	Small	...	*	**
Mother	S. acid	Striped	A.	Medium	*	*	...
Moore's Sweeting	Sweet	R. str	L. W	Medium	...	**	**
Michael Henry Pippin	Sweet	Green	E. W	Medium	...	*	...
Newtown Pippin	Acid	Green	L. W	Large	...	*	—
Northern Spy	Acid	Striped	W	Large	**	*	*
Paradise Winter Sweet	Sweet	Yellow	W	Large	*	...	...
Peck's Pleasant	S. acid	Yellow	E. W	Large	**	**	*
Pennsylvania Vandever	Acid	Striped	W	Medium	*	*	*
Pickard	Acid	Yellow	W	Large	...	*	*
Parte	Acid	Yellow	A.	R. large	*	**	*
Prior's Red	S. acid	R. str	E. W	Medium	—	*	*
Prolific Beauty	S. acid	Striped	E. W	Large	*	...	...
Primate	S. acid	P. yel	S	R. large	*	*	...
Rambo	S. acid	Striped	E. W	Medium	**	**	**
Ramsdell's Sweet	Sweet	R. str	A.	Large	*	...	...
Rawles' Janet	S. acid	Striped	L. W	Medium	...	**	**
Red Canada	S. acid	R. str	W	Medium	*	...	*
Rhode Island Greening	Acid	Green	E. W	Large	—*	*	...
Roman Stem	S. acid	Yellow	W.	Small	—	*	—
Rome Beauty	S. acid	Striped	W	Large	*	**	**
Red Stripe	Acid	Striped	S	R. large	*	**	...
Ragan's Red	Acid	Red	W	Large	...	*	...
Saint Lawrence	Acid	Striped	A.	Large	*	...	...
Spitzenberg Newtown	S. acid	Striped	E. W	Large	*	*	*
Spitzenberg Esopus	Acid	Striped	E. W	Medium	*	*	*
Summer Rose	S. acid	Y. Blsh	S	Small	...	*	...
Smith's Cider	S. acid	Striped	W	Large	**	**	**
Summer Queen	Acid.	Striped	S	Medium	—*	—*	*
Summer Sweet Paradise	Sweet	Yellow	S	Medium	*	—*	*
Swaar	S. acid	Yellow	W	Large	*	*	...
Talmon's Sweeting	Sweet	White	W	Medium	*	*	*
Trenton Early	S. acid	Yellow	A.	Large	*	**	*
Twenty Ounce	Acid	Striped	A.	V. large	...	**	**
Victuals and Drink	Sweet	Green	A.	Large	*	*	...
Wagoner	S. acid	R. str	W	Medium	**	**	**
Westfield Seek-no-further	S. acid	Striped	W	Large	*	*	*
White Pippin	Acid	Pale	W	Large	*	**	*
Winesap	Acid	R. str	W	Medium	*	**	**
Willow Twig	Acid	Striped	L. W	Medium	...	—*	*
Williams' Favorite	S. acid	Striped	E. S	Large	*	...	...

PEARS.

NAME.	Color.	Season.	Size.	N.	C.	S.
Bartlett	Yellow	E. A	Large	**	**	**
Belle Lucrative	Green yellow	M. A	Medium	**	**	*
Beurre d' Angou	Rus. yellow	M. A	Large	*	*	*
Beurre Diel	Rus. yellow	L. A	Large	*	*	*
Beurre Giffard	Mot. yellow	L. S	Medium	*	*	
Bloodgood	Yellow	L. S	Small	—*	*	*
Doyenne d' Ete	Blh. yellow	E. S	Small	*		
Doyenne White	Yellow	E. A	Medium	*	**	**
Duchess d' Angouleme	Green yellow	L. A	V. large	*	*	*
Early Catharine	Brown yellow	E. S	Small	*	*	*
Flemish Beauty	Brown yellow	M. A	Large	**	**	**
Golden Beurre of Bilboa	Gold yellow	E. A	Medium	*		

PEARS—Continued.

Name.	Color.	Season.	Size.	N.	C.	S.
Glout Morceau	Yellow	Win	Large	—*	*	...
Howell	Yellow	Aut	Large	*	...	...
Julienne	Green yellow	L. S.	Medium	—	*	...
Madeline	Yellow	E. S.	Medium	*	*	...
Onondaga	Rus. Green	L. A.	Large	*	*	—
Rostiezer	Green Brown	L. S.	Small	*	*	...
Seckel	Brown	M. A.	Small	**	**	**
Sheldon	Yellow	M. A.	Medium	*	**	*
Stevens Genesee	Yellow	E. A.	Large	*	*	...
Tyson	Yellow	E. A.	Small	*	*	*
Vicar of Winkfield	Yellow	E. W.	Large	*	*	*
Winter Nelis	Green yellow	E. S.	Medium	*	*	*
FOR DWARF.						
Louis Bonne d'Jersey				**	**	
Buffam				*	*	
Maria Louisa				...	*	

PEACHES.

Name.	Class.	Season.	Size.	Color.	N.	C.	S.
Bergen's Yellow	Free	Sept	V. large	Orange		—	*
Columbia	Free	Sept	Large	D. Red	...	*	*
Cooledge's Favorite	Free	August	Medium	White	*	...	*
Crawford's Early	Free	August	V. large	Blsh. yel	*	*	**
Crawford's Late	Free	L. Sept	V. large	Yellow	*	*	**
Cole's Early Red	Free	August	Medium	Red	...	*	...
Druid Hill	Free	Sept	V. large	White	...	**	—
Durham's Favorite					...	*	...
Early Barnard	Free	L. Aug	Medium	Yellow		*	...
Early Tillotson	Free	August	Medium	Red	...	—	—*
Fay's Early Anne	Free	L. July	Small	gr. white	...	*	...
George the Fourth	Free	L. Aug	Large	wh. blsh.	...	*	...
Grosse Mignonne	Free	August	Large	Red Yel.	*	*	*
Hale's Early	Free	July	Medium	Red	*	**	**
Heath Cling	Cling	October	V. large	White	**	**	**
Lagrange	Free	L. Sept	Large	White	—	*	**
Large Early York	Free	August	Large	Red	—	—	...
Late Heath Free	Free	Sept	Large	White	**	*	*
Morris' White	Free	Sept	Large	White	—	*	**
Morris' Red Rareripe	Free	August	Large	Gr. Red	—	**	*
Old Mixon Free	Free	Sept	Large	Yel. red	*	—*	*
Old Mixon Cling	Cling	Sept	Large	Red	**	**	**
October Yellow					...	*	**
Royal George	Free	August	Medium	Wh. red.	*	...	...
Serate Early York	Free	August	Medium	Red	**	*	*
Smock	Free	L. Sept	Large	Yellow		*	*
Snow	Free	Sept	Large	White	—	—	—
Stump the World	Free	Sept	Large	White	...	*	...

STRAWBERRIES.

Name.	Class.	Season.	Size.	Color.	N.	C.	S.
Agriculturist	S.	Medium	V. large	Dark crimson	*	*	*
Austin Seedling	S.	Late	V. large	Scarlet	*		*
Burr's New Pine	P.	Early	Medium	Crim. scarlet	*	*	*
Fillmore	P.	Medium	Large	Dark crimson	*	*	
French's Seedling	S.	Early	Medium	Scarlet	*	—	
Hooker	S.	Medium	Large	Dark crimson	*	*	*
Hovey's Seedling	P.	Medium	Large	Deep Scarlet		—	—
Jenny Lind	S.	Early	Medium	Bright scarlet	*		
Jucunda	S.	Medium	Large	Dark scarlet	*	*	*
Lennig's White	S.	Medium	Large	White	*	*	*
McAvoy's Superior	P.	Late	V. large	Dark crimson	*	*	*
Mote's Seedling		Medium	Large	Scarlet			
Russell	P.	Medium	V. large	Crimson	**	*	*
Triomphe de Gand	S.	Medium	V. large	Crimson	*		*
Wilson's Albany	S.	Medium	V. large	Dark crimson	**	**	**

TERRE HAUTE APPLE LIST.

Explanation:—Three dots (...) denotes that the variety is unknown, or not fully tested; a dash (—) that it is known but not approved; a star (*) that it is generally approved; two stars, (* *) much approved, or popular; a dash and star (—*) that it does well in some localities only.

Name.	Quality.	Name.	Quality.
American Summer Pearmain,	*	Keswich Codling,	...
Astrichan, Red,	*	King of Tompkins County,	*
Autumnal Swaar,	...	Large Yellow Bough,	...
Bailey's Sweet,	...	Ladies' Sweeting,	*
Baldwin,	*	Late Strawberry,	...
Bellflower, Yellow,	*	London Sweet,	...
Belmont,	...	Lowell	...
Benoni,	...	Maiden's Blush,	* *
Ben Davis,	...	Melon,	...
Broadwell,	...	Milam.	*
Bennefield, or Early June—*local*,	* *	Moore's Sweeting,	*
Buckingham,	...	Michael Henry Pippin,	*
Bullock Pippin,	...	Mother,	...
Carolina Red June,	* *	Millikin's Winter Sweet,	*
Campfield,	...	Newton Pippin,	*
Canada Reinette,	...	Northern Spy,	—*
Cumberland Spice,	*	Paradise Winter Sweet,	...
Cooper,	...	Peck's Pleasant,	...
Cooper's Market,	...	Pennsylvania Vandivere,	...
Dominici,	...	Pickard's Reserve,	*
Dr. Watson,	...	Pryor's Red,	*
Duchess of Oldenburgh,	...	Prolific Beauty,	...
Early Harvest,	*	Primate,	...
Early Pennock,	...	Rambo,	* *
Early Joe,	...	Rambo, Summer—*local*,	*
Early Strawberry,	...	Ramsdale's Sweet,	...
English Golden Russet,	...	Rawl's Jannett,	* *
Evening Party,	...	Red Canada,	...
Fallawater,	*	Rhode Island Greening,	*
Fall Orange,	...	Roman Stem,	...
Fall Pippin,	*	Rome Beauty,	* *
Fall Wine,	* *	Roxbury Russet,	*
Fameuse,	...	St. Lawrence,	...
Fenly,	...	Spitzenburgh Newton,	*
Fulton,	...	Spitzenburgh Esopus,	*
Gilpin,	*	Smith's Cider,	*
Golden Sweeting,	*	Summer Queen,	*
Glori Mundi,	*	Summer Sweet Swaar,	*
Gravenstein,	...	Talman's Sweeting,	...
High Top Sweeting,	*	Trenton Early,	...

Name.	Quality.	Name.	Quality.
Haglo,	*	Twenty Ounce,	*
Hubbardston's Nonesuch,	*	Victuals and Drink,	...
Hoop,	*	Wagoner,	*
Hannah—*local,*	*	Westfield Seek-no-Further,	*
Honey Creek Pippin—*local,*	*	White Pippin,	*
Indiana Favorite,	...	Wine Sap,	**
Jersey Black,	**	Williams' Favorite,	...
Jonathan,	**	Yellow Twig,	...
Jersey Sweet,	...		

PLAINFIELD HOTICULTURAL SOCIETY'S FRUIT LIST.

Explanation.—1st column—Class—A. for acid, S. A. for sub. acid. 2d column —Color—R., for red, Str., for striped. 3d column—Season—A., for autumn, W., for winter, E., for early, and L., for late. Hardiness of tree, productiveness, and quality of fruit are designated as first, second and third quality, first being best.

NAME.	Class.	Color.	Season.	Size.	Hardiness of tree.	Productiveness.	Quality.	Remarks.
American Golden Russett	S. acid.	P. russ.	E. W.	Small	3	2	1	
American Summer Pearmain	Acid	Striped	L. S.	Med.	1	2	1	Slow grower, long in bear'g.
Astrachan Red	Acid	Red	E. S.	Med.	1	2	2	
Autumn Seek-no-further	S. acid.	Striped	A.	Med.	1	2	1	Slow grower.
Baldwin	Acid	Red	W.	Large	3	1	2	Inclines to dry or bitter rot.
Belleflower, yellow	Acid	Yellow	W.	Large	1	3	1	Productive on white clay.
Carolina Red June	Acid	Red	E. S.	Small	1	1	2	Scabs badly.
Daniel Apple	S. acid.	Striped	E. S.	Small	1	1	2	
Early Harvest	Acid	Yellow	E S.	Med.	1	1	1	
Early Pennock	Acid	Striped	S.	Large	1	1	2	Rots on the tree.
Fallawater	S. acid.	Blush	E. W.	Large	1	1	2	Nearly sweet.
Fall Pippin	Acid	Yellow	A	Large	1	3	1	
Fall Wine	S. acid.	R. str.	A	Med.	1	1	2	Scabs in some localities.
Gilpin	S. acid.	R. str.	L. W.	Small	1	2	3	Nearly sweet.
Hagloe	Acid	Striped	S.	Large	1	1	2	Good for market.
Hoop	Acid	Striped	L. W.	Med.	1	1	3	
Horse Apple	Acid	Y. B.	L. S.	Large	1	1	3	Good to dry.
Indiana Favorite	S. acid.	R. str.	W	Med.	1	2	2	
Jersey Black	S. acid.	D. Red.	E. W.	Med.	2	1	2	
Jerminite	S. acid.	Striped	L. W.	Med.	1	1	2	
Sweet Bough	Sweet	P. yel.	Sum.	Large	2	3	1	
Maiden Blush	Acid	Blush	A.	Large	2	1	2	Good market, bears early.
Melon	S. acid.	Striped	E W.	Med.	1	1	2	
Milam	S. acid.	R. str.	W.	Small	1	1	1	Subject to bitter rot.
Moore's Sweeting	Sweet	R. str.	L. W.	Med.	1	2	2	
Michael Henry Pippin	Sweet	Green	W.	Med.	1	1	1	Early bearer.
G. N. Pippin	Acid	Green	L. W.	Med	1	2	1	Scabs badly.
Northern Spy	Acid	Striped	W.	Large	1	1	2	Late in bearing.
Penn. Vandever	Acid	Striped	W.	Med.	1	1	2	
Pickard	Acid	Yellow	W.	Large	1	1	1	Not fully tested here.
Prior's Red	S. acid.	R. str.	W.	Med	2	3	1	
Rambo	S. acid.	Striped	L. F.	Med.	1	1	1	
Rawles' Janet	S. acid.	Striped	L. W.	Med.	1	1	1	
R. Island Greening	Acid.	Green	W.	Large	2	2	1	
Roman Stem	S. acid.	Yellow	W.	Small	1	2	1	
Red Stripe	Acid	Striped	E. S.	Large	1	1	2	
Newtown Spitzenburg	S. acid.	Striped	E. W.	Med	1	2	1	
Summer Rose	Acid	Striped	S.	Small	1	2	1	
Smith's Cider	S. acid.	Striped	W.	Large	2	1	3	Good for market, &c.
Summer Queen	Acid	Striped	S.	Med.	2	2	2	
Talmon's Sweeting	Sweet	Yellow	W.	Med.	1	1	2	
Trenton Early	Acid	Yellow	S.	Large	2	1	2	
Victuals and Drink	Sweet	Green	A	Large	2	2	1	
Westfield Seek-no-further	S. acid.	Striped	W.	Med.	1	2	1	
White Pippin	Acid	White	W.	Large	1	1	1	
Winesap	Acid	Red	L. W.	Med.	1	1	2	
Vandever Pippin	Acid	Striped	W.	Large	1	2	2	
White Winter Pearmain	S. acid.	Yellow	W.	Med.	1	2	1	Scabs badly.
Yellow June	Acid	Yellow	E. S.	Small	1	2	2	Desirable for its earliness.
Pennock	S. acid.	Red	W.	Large	1	1	2	Specks badly.
Limber Twig	Acid	Red	W.	Med.	1	2	3	
American Pippin	Acid	Striped	L. W.	Med.	1	2	3	
Kirkbridge White	Acid	Yellow	S.	Med.	1	1	1	Tree poor grower.
Belmont	S. acid.	Yellow	W.	Med.	1	2	1	Not fully tested.
Clayton	S. acid.	R. str.	W.	Med.	1	1	2	
Ortley	Acid	Yellow	W.	Med.	1	2	2	Scabs badly, worthless.

APPENDIX.

REPORT OF DELEGATES TO THE MISSOURI STATE HORTICULTURAL SOCIETY.

BY WILLIAM PATRICK, OF TERRE HAUTE, INDIANA.

We arrived in the city about ten o'clock A. M., on the 14th, and went direct to the Horticultural Rooms in the Court House, where we found members gathering from the different points of the compass. Illinois furnished a goodly portion of them, and, by the way, they are about as intelligent and energetic a body of horticulturalists as you will often meet. They are men from nearly all parts of the country, and their great aim seems to be excelsior. After a hearty good greeting of old and new acquaintances, and co-laborers in the great cause of scientific horticulture, they proceeded to display their fine fruits. Yes, we might say magnificent, for some of them were of immense size—the largest we ever had the pleasure of seeing. There were apples from almost all parts of Missouri, as well as some from Illinois and Indiana. The show in the number of varieties did not equal the display we had at our own meeting on the seventh, eighth and ninth of this month, yet it made up to some extent in size of specimens.

We will mention the names of some of the varieties that appear to do best, and were of large size: White Pearmain, Rome Beauty, Willow Twig, White Pippin, Smith's Apple, Tulpehocken, Penock, Rawl's Jennett, Wagoner Rambo, and many others, mostly of those varieties that do best in the central and southern portions of our own State.

The largest and finest specimens on exhibition grew north of the Missouri River, on the high rolling limestone soils, showing that section of the State well adapted to the growing of the apple in its perfection of size and with a better flavor, than we could expect in such large specimens. There were some good specimens from Illinois, and we should not omit to mention that some of the most beautiful specimens on exhibition for color and perfection, were from our own State, proving that our soils have some of the finest qualities for the productions of horticulture.

Of pears, there were but few specimens, yet of fine quality.

The wine growers of Missouri and Illinois were there in their strength. Judging from the many fine samples of native wine on exhibition, it is proving a success. Prominent among this class was George Herman, of Herman, Missouri, with his fine samples of the native juice of the grape; also many other prominent and successful growers of the grape, from other States. The samples of wine on exhibition numbered near fifty, and *yours truly* finding his name enrolled as one of the committee on wines, to which he did not object, though he thought they could have done better.

In testing the wines, the committee found that the vintage of the past year far surpassed the samples of former years on exhibition, in richness and bouquet, that makes a fine wine. Among the many fine samples on exhibition, we will mention some of the most prominent.

Of the Delaware, there was only one sample, the scale of merit ranging very high, and of a decided fine flavor, characteristic of that grape.

Of Norton's Virginia, the samples were good, showing this grape to combine a strength surpassing all other varieties in the material that makes a wine of the highest medicinal qualities, and containing most too much strength for a table wine. It was generally of a very high grade, and one of the Missouri favorites for profit.

Next on the list was that finest flavored of all native wines, the Herbermont. It has a richness of flavor that surpasses all others. The vine is rather tender in this latitude, which precludes it from coming into general cultivation at present; yet with a soil not too rich, and proper treatment, it succeeds well, yielding immense crops of the finest fruit for both table and wine.

Of the Clinton samples, that much abused grape, generally from the ignorance of the grower in not giving time to mature its fruit before being used, the vine is a strong grower, hardy, and a profuse bearer. Of its many hidden qualities, we would say when well matured, it is fine to eat from hand, and produces a wine of good quality as the samples exhibited, proved, as they stood well up in the scale of merit.

Of the Catawba, there were many samples, some of a very good quality, others of a low grade, indicating some deficiency in the manufacture of the latter, else the grape not having been matured before it was taken to the press; we think the latter generally the cause of the deficiency.

But prominent in the long list of wines stood the noble Concord, which appears to be the general favorite among the wine growers of the West, as well as those who grow the fruit for market. Its merits are many; hardiness of vine and leaf, retaining its foliage until frost, immense yield of fruit, easy of management, doing well in most all soils, and yielding large profits from the sale of the fruit or juice. Combinations which the wine growers of the West appreciate, and take due advantage of, judging from the many fine samples of this variety shown on the tables, as well as the reports of the large profits derived from the sale of the wine.

The attendance on the second and third days was larger than on the first, many not being able to leave their business more than two days.

Among the many prominent persons in attendance, we had the pleasure of making the acquaintance of O. A. A. Gardner, editor of the *Horticulturalist and Farmer*, published at De Soto, Jefferson county, Missouri, a live Western paper of merit. Norman J. Coleman, editor of *Coleman's Moral World*, now in its twenty-first year, and, by the way, one among the best papers in the West for the farmer and horticulturist. Also, C. W. Murtfeldt, assistant editor of the latter, a live horticulturist of practical experience, Messrs. Flagg, Rheil, Wilgus, Starr, and many other prominent horticulturists of Illinois and Missouri, among whom we would mention Mr. Douglas, of Waukegan, Illinois, who has succeeded in growing evergreens by the millions from seed, to beautify and shelter the vast prairies of the West, giving the present generation an opportunity to do a great and lasting good for the present, as well as future generations at a very small expense, in planting the young evergreens for ornament and screens. Something the farmers of our State are neglecting to their own injury in the future, as they are stripping the lands of all shelter and shade by clearing off the timber, with not a thought of what influence it may have on the climate in the future. We hold that God gave us this fine country and soil to take care of and improve, not to strip off all we find growing on it so that the scorching rays of midsummer sun may burn up vegetation, and the chilling winds of winter blight our fruit crops, when we have it in our power to leave it in as good condition as we found it. We should all try and do some planting for shelter, be it ever so little.

After the enjoyment of a feast of the intellect and tastes for four days, which will be long remembered with pleasure, the Society adjourned to meet on the 2d Tuesday in December next.

Before closing, we would say something of the liberality of the railroads running into St. Louis. The Society appointed a committee to call on the officers of the different roads to arrange for the return of its members to their homes, which most of them promply offered to do free of charge. The Ohio and Mississippi, and Terre Haute and St. Louis roads were the only ones that refused to make any reduction, and yet they carried large delegations and are heavily patronized by the horticulturalists. It is an old saying "that companies have no souls." We think it is true in this instance.

ORCHARDS AND FRUITS OF SOUTHERN INDIANA AND ILLINOIS.

BY ELLIS LAWRENCE, OF PLAINFIELD, INDIANA.

In Owen, Monroe, Lawrence, and Green Counties, we found less interest taken in horticulture than in many other sections of the State. An abundant apple crop, however, was to be seen wherever an orchard appeared.

In one thing, however, we believe this region of country will excel in, that is native blackberries; we found them growing spontaneously, excelling in size and flavor many of the cultivated sorts, and, we believe with the proper cultivation, would rival the most, if not all now in cultivation.

In Knox County, the cultivation of apples and peaches is claiming considerable attention. Large orchards are being put out on almost every farm, many of which we observed bearing a considerable amount of fruit. Here we found the "apple blight" prevailing, which extended across Southern Illinois, as far west as we traveled, to the Mississippi River.

While at Vincennes, we were the guest of that intelligent nurseryman and enthusiastic fruit grower, S. Burnett, Esq., whose beautiful residence and grounds is on the hill just east of the city. Mr. Burnett has everything in the line of fruits that will grow in this climate. He had quite a lot of peaches which he was shipping to the northern markets. Friend Burnett esteems the best seedling varieties equal to any of the budded.

One of the most interesting incidents of our ramblings, was a visit we made to the Big Pear Tree near this place. Twelve miles north of Vincennes, on what is called the Ocheltree farm, stands the largest pear tree in the world. The scion was brought from Pittsburg, Pennsylvania, in 1802; first planted in Vincennes, and two years subsequently transplanted to its present place. Some years ago, a large portion of it was carried away by a storm, but enough remains to give the visitors an idea of its former granduer. It measures eleven feet and ten inches in circumference just beneath the first limbs. Our friend J. A. Little, (with whom I was traveling,) plucked some fruit from its venerable branches with his fruit gatherer. The altitude of the topmost limb was sixty-five feet from the ground, and the greatest diameter of its branches seventy-five feet. We were informed by the present owner, that its capacity for bearing was two hundred bushels. The fruit is of medium size, quite sweet, and ripens early in September. I think I am safe in calling it the largest pear tree in the world, since the one in Scotland heretofore supposed to be the largest, is only eleven feet in circumference, and not so high as this by some feet.

In Gibson and Posey Counties, we found plums bearing abundantly, mostly a native variety called the "Wabash;" fruit large and conical, tree grows low and scrubby, and comes into bearing early. We saw a farmer gathering from a small orchard of this variety, which was about six feet high. He was shipping his fruit to the Indianapolis market and realizing four dollars per bushel.

We would remark in this connection, that in the "Pocket" of Indiana, we have one of the most beautiful and fertile sections of country to be found in the West· Knox, Gibson, and Posey Counties are not excelled in the State as fruit growing or farming counties, much as the pocket has been slandered and laughed at by those who did not know what they were laughing at.

In Southern Indiana and Illinois, we find many new varieties of apples not known to the horticulturists, having been introduced from Kentucky and other Southern States, many of which are worthy of cultivation. We find as we proceed southward, winter apples that grow in a more northern latitude ripen earlier in the season.

Crossing the Wabash river at New Harmony, we passed into Southeastern Illinois, in which country we found but little attention paid to horticulture. Some attention is paid to cotton culture in a small way. In the counties White, Wayne, and Marion, hundreds of acres of castor beans could be seen on every hand as we passed along, which to us was a new article of husbandry. The scene was picturesque, presenting to the eye a beautiful blue etherial appearance in the distance. The culture of the castor bean is about the same as that of corn. The beans, or pods, commence ripening in August, and continue in an irregular manner till frost. The harvesting commences as soon as the ripening sets in. The usual mode of gathering is done with light sleds, upon which is placed a box holding from six to ten bushels, in which the pods are deposited, which is drawn by a horse between the rows. The pods are cut off with a large knife, the parties passing along on each side of the sled taking from two to four rows. They are then hauled to the barn and put in a tight room where they are allowed to dry and pop out, after which they are cleaned and taken to market. The yield is from eight to fifteen bushels per acre, and bring from one dollar and fifty cents to two dollars and fifty cents per bushel.

In the vicinity of Centralia is a great fruit region, principally the peach. We visited a distinguised fruit grower, Rev. Thomas Casey, near Mt. Vernon, Jefferson County, who takes a great interest in the peach and apple culture. Of the peach, he only cultivates two varieties, viz: Crawford's Early and Late ——, of which he counts on an average yield of two hundred and fifty dollars per acre. His best winter apples were the Wine Sap, Rome Beauty, and Spitzenburg. He spoke of the Ben Davis as being a good bearer, but bad to rot, and hence considered it almost worthless. The most beautiful peach orchard we saw in this region, was one of four thousand trees, all of cultivated varieties, and averaging perhaps one bushel of peaches per tree, which were being gathered and shipped to northern markets.

After leaving the Illinois Central Railroad, we passed through a region of country westward in the direction of St. Louis, mostly settled by Germans and Swiss, who pay but little regard to fruit raising.

On arriving in Madison County, we had the pleasure of forming an acquaintance with W. C. Flagg, Secretary of the Illinois State Horticultural Society, who is a very large farmer and an extensive fruit grower. He has a farm of one thousand acres, upon which he has an orchard of peach and apple of eighty acres. His peaches consist of the following varieties, viz: Hale's Early, Troth's Early, Early York, Red Rare Ripe, Yellow Rare Ripe, Early Crawford, Late Crawford, and Old Mixon Free. Of the early varieties he esteems the Early York the best, and the Yellow Rare Ripe the most superior in flavor to all others, but uncertain in fruiting. His variety of winter apples are, Pryor's Red, Newton Pippin, and Rawl's Jannett.

At the time we visited him, which was in the latter part of August, he was plowing and harrowing his peach orchard to counteract the effects of the drouth, and also to keep up the size of the fruit.

The next place of note we visited was that of Dr. Hull's, situated four miles above Alton, on the Mississippi river. He is one of the most distinguished fruit growers in the West. His farm is situated on a kind of a promontory, at an elevation of two hundred and eighty feet above the river.

The most remarkable feature of Dr. Hull's enterprize is the success with which he cultivates pears, cherries, and plums, especially the latter. His high elevation and peculiar location is a preventive against frosts, and the ravages of the curculio he mitigates by catching and destroying them, which is done by means of a kind of forked inverted parachute, made of canvass, and arranged on a wheelbarrow frame with a bumper situated in front of the wheel to jar the tree with. He visits his trees every other day with this machine, jarring down and securing the insects, commencing about the first of May, and continuing to the first of July. In this manner he had caught and destroyed more than a half bushel of insects this season. He trims up his peach trees, making nice smooth bodies for about four feet. Keeps the top thinned out to keep up size of fruit and to prevent overbearing. He also practices a thorough cultivation of the soil, plowing and harrowing at least three times during the season.

The next place of interest was J. F. Hoffmeister's. Mr. Hoffmeister is an old pioneer in horticulture, said he had been engaged in it for more than thirty years. His orchards consisted of eight hundred peach, one thousand apple, and four hundred pear trees, situated on very high rolling grounds, soil clay. His pears were just coming into full bearing, consisting of nearly every variety known to pomologists. The four hundred trees were set on three acres, which he considered worth four thousand dollars. The blight had made its appearance this season, and he was much discouraged having already lost some of his finest trees. He taught us his mode of pruning large limbs without injury to the, which we deem worthy of record, viz: Cut the limb off perfectly smooth with the body, in the spring; nature at once commences to heal the wound by pushing forward new wood and bark, forming a ridge or roll around the cut. The following spring make an incision around this roll laying the wood bare, the wood and bark again pushes forward during the season, and by repeating this process for two or three seasons, the wound will heal over perfectly sound and smooth. This he demonstrated to our satisfaction by a practical experience in his own orchard. He spoke of his experience of protecting peach trees from late frosts by smoke. This was done by building a series of brush and log heaps on the east side of the orchard, upon which he put a quantity of coal tar, and when a frost was imminent fired the heaps just before sunrise, the coal tar facilitating the volume of smoke casts a shadow over the orchard giving the buds time to thaw gradually before the sun's rays strike them. In this way he succeeded in getting a full crop of peaches one season, while there was a general failure throughout the country. On this occasion the morning was very still and frosty, the smoke ascended perpendicularly upward, and cast a shadow three miles distant westward, and protecting the fruit as far as it reached.

In conclusion, we would remark that the people of Southern Illinois bid fair to rival all other sections in the United States in fruit culture. It will make any hoosier open his eyes to travel among these enterprizing Yankees and see what they are doing. Go into the neighborhood of Bunker Hill, twenty miles northeast of Alton, and there they will tell you that a thousand trees is an ordinary orchard. The President of the Bunker Hill Horticultural Society, Mr. Hopper, informed us he had in his orchard three thousand apple, two thousand peach, and one thousand cherry trees, nearly all Early May, six hundred of which were bearing, from which he realized four dollars per bushel last season.

This is but one of the many instances of the kind to be found in Southern Illinois; let the hoosiers wake up.

RANDOM NOTES OF A JOURNEY EAST.

BY W. H. RAGAN.

During last July and August (1867,) the writer took a trip East, stopping at *some* of the places of interest on the route, and having been solicited by leading members of the Indiana Horticultural Society to give a brief account of things of interest for transactions of the Society, I have concluded to make the effort.

Leaving home on the 22d of July, I proceeded, by way of the Peru and Indianapolis R. R., to Ft. Wayne, stopping a few days with our worthy President, I. D. G. Nelson, at his beautiful country seat four miles east of the city, and immediately on the Wabash Valley Railroad. I was warmly received by Mr. Nelson and family, who seemed to spare no pains to make me welcome. At the time I was there that particular section of country was being scourged by a most severe drouth, which was really assuming a very serious appearance; vegetation was almost entirely suspended, with a very poor prospect for fruit of any kind being good. I am happy to see, however, fine specimens of apples and other fruits on exhibition from that section of the State, from which I should infer that the drouth did not continue long after I was there. Mr. Nelson is eminently practical, and any one who will visit his place, will have cause to feel justly proud to think that we have such a man to lead the horticultural interest of our State. With all his care and attention, however, he has been unable to succeed with dwarf pears, as his extensive orchard of dwarfs (rather failures) will testify. I shall have more to say on this subject hereafter.

In company with Mr. Nelson I visited the agricultural and horticultural rooms in the Court House, which are really the best arranged and most perfect suit of rooms for the purpose that I have ever examined. They are making a collection of all the birds and animals, native of Allen county, which are to occupy suitable cases in one room; also specimens of grain, fruits, paintings and minerology, which will be of great interest hereafter, especially so of birds and animals, many of which are destined ere long to become extinct.

I parted with friend Nelson and family with reluctance, and pursued my journey eastward, down the beautiful Maumee Valley, to Toledo, at the head of Lake Erie. This is a very flourishing place, and the headquarters of several leading nurseries. It was harvest time, and the abundant wheat and hay crops were being cared for. There had been plenty of rain, and all vegetation was alive "and doing."

I regret very much that my run from here to Cleveland was in the night. I stoped over at Cleveland a short time but did not visit any of the many places of interest here to horticulturists.

My next stop was at Rochester, and the first place visited there was Genesee Falls. These falls are very insignificant when compared with the rushing torrent that pours over the granite walls of Niagara, but certainly very worthy of a visit from all who can make it convenient to do so. There is a beautiful unbroken sheet of water fifty or one hundred yards in width and about eighty or ninety feet of fall, which is completely lashed into spray before reaching the abyss below, forming a waving curtain, wafted to and fro by the winds, and as white as the "driven snow flake." Probably a large amount of the thrift and enterprise of the city of Rochester owes its origin to these falls—the water privileges they give. This is used to the greatest possible extent for manufacturing purposes.

While at Rochester I also visited the extensive nurseries of Elwanger & Barry. This is the largest establishment of the kind in the country, and has but few if any equals in the world. They claim to have eight hundred acres in cultivation, and judging from what I saw I should think this no exaggeration. In answer to the inquiry as to where they found a market for all their stock, I was informed that they could sell all they had in the territory of our own State, Indiana. This is certainly very strange, when we remember that most of our own home nurseries are failures for the want of patronage. It is an illustration of the tendency of the human race to patronize "the far fetched," and no doubt in this case it very often turns out to be the "dearly bought." But I return to a description of this magnificent establishment. The visitor enters the grounds through a large arched gateway fronting on one of the leading thoroughfares entering the city from the south, and upon which street cars are constantly plying to and from the city. This gateway is standing open from an early hour in the day until evening, inviting all who wish to enter both in carriage or on foot, subject only to certain rules and regulations which are made conspicuous in many places in the enclosure. There are no restraints except the requirements of good breeding—to keep in the walks—*see all* you please but handle *nothing*. There is an office near the entrance at which you may register, if you wish, and leave any articles you do not wish to be encumbered with. From here you may go in almost any direction, following gravel walks kept in the best possible style, and bordered on each side by closely shorn lawns or beds of the most exquisite beautiful flowers, and generally hedged in by low, ornamental hedges of the beautiful and rare plants, of which there seems to be no end, that will bear shearing. These walks are, in some instances, straight, others are serpentine, all enclosing or surrounding plats of ground devoted to the cultivation of some particular species or sort of fruits, trees, vines or flowering plants for sale. Interspersed through the grounds, in appropriate places, are numerous hot and green houses with propagating pits, for the cultivation of the rare and tender varieties. These, too, are opened to visitors, and form to the horticulturist a very interesting feature of these well kept grounds. This description applies only to the front or more public grounds of the establishment. It will be remembered that this eight hundred acre nursery is not in one enclosure, but in detached sections, and scattered over a large neighborhood of country. These outside lots do not all comprise so much that is beautiful as the home nursery, but are all cultivated in a thorough and substantial manner, and generally in some one or more of the different species belonging to this branch of industry. Rochester is the great nursery emporium of the world, and I might have visited many other establishments similar to, but less extensive than the one described, in the vicinity of the city, but my time was precious and I must journey on to Waterloo, New York, where I made the next halt.

Before going further, however, I will attempt a description of this beautiful and fertile country, (the Genesee Valley,) through which I am now passing, as seen from the car windows as we flit along. Beginning at Batavia, and extending eastward along the New York Central Railroad through the central portion of the State, with some isolated exceptions, is the most thoroughly cultivated and improved country through which I have ever passed. The farmers were busy harvesting their wheat crop, which was uniformly good, much better than we have ever had in the West, and better than we ever *will* have until we learn to cultivate better and economize our means, (which are now wasted,) as we will soon have to do. Corn, our great staple crop, is not cultivated to much extent in this country, but I noticed many large fields of hops, which have not been cultivated with us. This crop seems to be cultivated in hills four or six feet apart, each hill having a pole for the vines to climb twelve or fifteen feet high. As the vines ascend this pole, with their luxuriant foliage, it forms a dense, dark wilderness not unlike some of our Western bushy, vine-clad jungles.

The great pest of this beautiful region is the Canada thistle, and I am truly sorry to learn that it is already "naturalized" in some parts of our State. There are laws on our statute books which should be rigidly enforced, and I might add that this is a mighty argument against the purchase by our citizens of Eastern grown nursery stock, as it may be introduced either in the material used in packing or on the roots of trees and plants. I saw it growing in all parts of Elwanger & Barry's nursery, notwithstanding their thorough cultivation. Unlike our common or bull thistle, it is a perenniel plant, and when once established it is almost impossible to kill it.

At Waterloo I visited the vineyard and dairy of Mr. Joseph Wright. A description of his dairy in a paper like this, devoted more especially to horticulture, would perhaps be out of place, besides I already find that I have too much material for this report; but allow me to say that everything was in the best of order, and a general system prevailed throughout. His vineyard, like his dairy, was not extensive, but that same order and system was manifest. He only cultivated two varieties of grapes—the Isabella and Delaware—both of which seemed to do well. His soil was a gravelly clay loam, and would hardly be selected with us as suitable soil for a vineyard. His Isabella were free from rot at the time I was there (August 1st) and looked as though they might remain so. Delaware grew finely, was free from leaf blight, and had a very promising crop of fruit.

Three miles east of Waterloo is Seneca Falls, where I spent several days. This is a great manufacturing point, but I did not find much that would be of interest to horticulturist.

Passing eastward, with an eye open for anything interesting, I got a glimpse of the States Prison at Auburn, the salt works of Syracuse, which of themselves would furnish material for an interesting paper; the beautiful Mohawk Valley, Albany, the Hudson River with its magnificent scenery, and finally land in the great and busy metropolis.

I arrived in New York on Tuesday morning, and after a good wash (for he who travels by railroad in August needs this,) and refreshments, I repaired to Cooper Institute where I enjoyed two hours with the Farmers' Club. After the reading of many interesting letters from correspondents from all parts of the country, and much valuable discussion, Mr. William Parry, of Cinnaminson, New Jersey, was introduced with samples of Wilson's Early Blackberry, which were certainly very fine, and so voted by all present. They were ripening considerably in advance of most varieties, as well as much larger than anything of the kind I had ever met with. On one small stem about one foot in length there was reported to be 500 berries, nearly all of which were ripe at the same time. The berry is longer, sweeter, and less pulpy than the Lawton, besides being ten days earlier. I also visited, while in the city, the office of the American Agriculturist and Scientific American. My time being limited, I was on the point of leaving the city, when, on meeting a friend, he would not allow me to do so without first visiting that great pet and the pride of all the metropolis, Central Park, and to those who can appreciate the beautiful in nature and art I would say that I never have had cause to regret the expense and loss of time. It seems to be ordained, and I suppose justly so, that a large part of the human race should have their habitations among the gloomy walls of cities, and for such I cannot envy the great privilege and blessing they must enjoy in an occasional visit to such a beautiful and romantic place as is Central Park. If, however, the human mind can look into the future, and see things not as they are, but as they will be, the proprietors of cities might remove a large tax from posterity by judiciously saving adjacent to their contemplated city suitable grounds for parks, together with the native forest. In the case of Central Park there has been millions expended in trying to replace what a profligate ancestry have destroyed. Just so our great forests are melting before the ax, and before the end of another generation it will take millions to replace the wanton waste of our day.

My journey having culminated in New York, I now set my face homeward by way of Philadelphia and Baltimore. My passage over this interesting part of the road was unavoidably by night. At Baltimore I spent several days, being comparatively at home there. Here I visited Druid Hill Park, which rivals Central Park in beauty; Green Mount Cemetery, and ascended Washington Monument; from whose giddy heights I looked down on the habitations of nearly 300,000 people the beautiful bay and Patapsco river lay like jewels of silver far away toward mother ocean; Fort McHenry, of historic notoriety, and before whose portals the disabled and defeated British fleet retired in 1814, is visible far down the bay on Locust Point. It may be of interest to some to know that the incidents that called forth that beautiful ballad, and now our national air, the "Star Spangled Banner," are intimately connected with this old fort. Again, far to the left, may be seen the dismantled form of Fort Marshall, within whose dismal walls the writer spent six months as a private soldier in defence and in full view of that beautiful "banner" that *still* floats over the frowning walls of Fort McHenry. But this is not horticulture.

From Baltimore I wended my way to the National Capital, stopping at Laure, Station with a friend who now owns part of Col. Capron's old farm, upon which he is said to have won his first notoriety of an agriculturist in his experiments with lime as a ferlilizer. The effect is still visible, and it is now the best farming land that I have ever seen in the State.

After visiting many of the interesting and historic localities in the National Capital, I took a thorough survey of the beautiful grounds of the Smithsonian Institute, the adornment of which constitutes almost the crowning feat of the lamented Downing. I do not suppose that our continent can show a more complete triumph of rural architecture. And while here, although not strictly appropriate, I must say a word in favor of a visit not only to these grounds, but a careful study of the vast museum and cabinet of curiosities stored within the walls of this noble institution, erected and supported by the benificence of a foreigner.

I next visited the Congressional Gardens, situated near the west front of the Capitol, Here it seems to be the desire of these in control to present the visitor as much of tropical climate as possible. The trees and plants are better grown than any I have met with. The buildings, when complete, are to constitute a cross of collossal proportions, in which will be grown not merely plants and shrubs but large trees. There is a small amount of ground belonging to these gardens that is cultivated in various ways and for various purposes, under the patronage of the Government. Near these gardens, and on Missouri Avenue, are situated the Government Experimental Gardens, under the superintendence of that eminent horticulturist, Mr. William Saunders. The object of these gardens are to experiment with and test the various new productions of horticulture. It is a great tax on individual effort to test the numerous new things now rapidly coming up in the shape of new seedlings, etc., and the Government has wisely taken hold of the matter for the good of its citizens. Here I saw fruiting, under similar circumstances, two hundred varieties of grapes, and perhaps as many of pears, peaches, also, and plums, apricots, cherries, and all the small fruits, besides thousands of flowering plants, many of them in bloom, and forming the most gorgeous display of the kind that the mind can conceive of, besides many other novelties. I also saw many tender varieties of fruits growing under glass; foreign grape vines growing with one branch under glass, another in the open air, to show the contrast, which was marked; covered trellis for one vine, another of the same kind exposed; plants of Delaware and other tender leafed varieties covered, others not, and many other experiments, which though simple and cheap, were yet very interesting.

As I took no notes, not expecting to be called on for a report of my trip, and writing from memory, I find it very difficult to particularize in regard to the merits and demerits of particular varieties in this large collection; but I remember that the Adarondack was approaching most nearly to ripening of any of the many varieties of grapes. The season was very favorable, and all looked well. An unfavorable season like the last would have given a better test of the worth of different grapes. Concord was uniformly good, and I guess we may *tie* to it. Iowa leaf-blighted badly, and seemed to be a poor grower. Pears were looking finely, and here were some of the most interesting features of the whole garden in the relative merits of dwarfs and standards. In all the experiments here practiced two subjects of each variety were taken, and in case of pears, one of dwarf and one standard. Under the same treatment, and but a few feet apart, this test can but be considered a fair one. In almost every instance the standard was much the best tree, with a fair promise of continuing so. Mr. Saunders seems well pleased with the Philadelphia raspberry.

But I fear I am becoming tedious, and although the subject is not nearly exhausted I fear the reader's patience is, and hence will take the next train for home. I go by way of the Baltimore and Ohio Railroad, enjoying its picturesque scenery, which is of itself well worthy of the trip. It was my intention to stop over with Dr. Warder, at Cincinnati, but while in the city I learned that he was not at home, so I have no doubt lost some valuable material which I could have gathered there. But at some future time I hope to be able to visit his place for the especial purpose of making some gleanings.

THE MANUFACTURE OF CIDER VINEGAR.

BY I. D. G. NELSON.

"Pure cider vinegar" is advertised and sold everywhere by vinegar manufacturers to dealers and traders, and by them with honest intentions, no doubt, retailed out to consumers as such, when, in fact, it is made of the most deleterious acids and poisonous compounds, and does not contain a single drop of the juice of the apple

Dr. Daniel Lee, a well known eminent chemist, when in Washington City, wrote a lengthy article for the "Country Gentleman," on the "art of vinegar making," from which the following brief extract is taken:

"There are many reasons why the art of making vinegar, by the quick, scientific process, should be universally known, a few of which I will name: 1st. It will drive out of the market diluted oil of vitriol, now extensively used under the name of vinegar, to the destruction of human teeth, the injury of the bones and of general health. Twenty dentists are now required to take care of the damaged teeth of a population that would have employed only one forty years ago, when vinegar was *actic acid* derived from a vegetable source, unadulterated by any mineral acid or poison.

2d. "Acetic acid in hard cider, and in many other forms, has long been known to prevent jaundice, billious fevers, constipation of the bowels, ague and fever, and other not uncommon maladies. In a word, if properly used, vinegar is a fruit and plant acid of inestimable value, and no more need be said in its favor in this connection."

Grapes, currants, and all berries, sorghum, beets, and other vegetables containing sugar, will make good and wholesome vinegar, according to the Doctor's theory, and should be used rather than resort to the poisonous substances of which the vinegar now in general use is composed. Whisky, for many years, was extensively used in the manufacture of vinegar, and furnished a large portion of the commercial vinegar usually found on the market, but when the revenue tax of two dollars per gallon was added, it at once stopped its manufacture into vinegar. In addition to this, the great scarcity of apples, owing to the successive failures of the crop in many sections of the country, created a sudden vacuum, which afforded an opportunity for another substitute, and the result is, as has been carefully estimated, that not more than one barrel out of every six hundred and fifty marked on the head "pure cider vinegar," and sold as such, is made from apple cider, or contains the juice of a single apple, but is manufactured out of everything else, and in most cases composed of the most villainous compounds imaginable.

During the discussion on the subject of the destruction of orchard insects at the North American Pomological Society meeting at St. Louis, last September, I took occasion to say that I considered the best and most certain method of destroying a considerable portion of the apple moth was to gather up all the fruit as fast as it fell from the trees and put it into vinegar. It was a method I had very satisfactorily pursued, and had recommended it to others, answering, as it did, the double purpose of destroying a large portion of worms and converting the fruit that would otherwise be lost, into vinegar. At our own State Fair, held at Terre Haute soon afterwards, the subject was again called up at a meeting of the Horticultural Society, and I was requested to prepare a paper for the transactions of this society on the subject of vinegar and vinegar making, which does not seem to be as well understood as it ought to be. My method is exceedingly simple and enveloped in no mystery whatever. I have no secrets to withhold, no underground cellars or vaults, no private apartments ornamented with placards, "no admittance."

My cider house is constructed with a view to convenience and economy in the manufacture of cider and vinegar, and is used for both alternately as the season requires. During the fall and until all the apples are ground up I make all the cider I can and store it away in pipes, barrels, etc., under an open shed convenient to the cider house, where it will generally undergo vinous fermentation, and by the addition of a little good strong old cider vinegar it frequently gets quite sour before cold weather, and sometimes is fit for market by adding a little more strong vinegar. As soon as we are through making cider for the season we remove the horse power (endless chain) grinder, pressing crib, vats, pumice boxes, etc., out of the basement of the cider house and commence at once filling it with double and treble tiers of barrels of racked cider from the shed; start up the fire in the furnace, which is so constructed as to be out of the way when making cider, and the cider house is thus quickly converted into a cheap and excellent vinegar house. The thermometer is kept at about 75° farenheit, and the process of vinegar making commences at once. If some of the casks appear a little "lazy" and not inclined to make vinegar as fast as they should, I take empty casks and put four gallons of the best vinegar in each and drip slowly the contents of the sluggish casks, sometimes through hard wood shavings, but more generally over a board, into a dripping trough, then into the casks prepared as above—the object being chiefly exposure to atmospheric air by reason of which it becomes acetified. Thus it is quite frequently the case that the larziest casks are first fit to go out of the vinegar house, which we remove, as well as all others, as fast as they are ready to the cellars, where they remain until required for market, so that by the time the house is required again for cider making, all the old cider is converted into vinegar and removed out of the way. The endless chain horse power, cider mill, vats, etc., are put back in less than half a day, and the vinegar house is now converted into a cider house again and the work goes on as before. The apples are scooped out of the wagons and thrown upon the upper floor through a convenient door, when they run off on an inclined plain to such part o the chamber as they are needed, or at once thrown into a hopper that feeds itself. The whole work is done with a small amount of labor, which is one of its chie recommendations.

This is, in brief, my method of working up a few thousand bushels of apples, many of which were formerly wasted or from which I realized a very insignificant sum. The same thing is within the reach of any farmer who can command a few hundred dollars to start with on a cheap scale, and out of which, if he has the apples himself or can purchase them at a reasonable price, he may soon build up a lucrative and legitimate business, and at the same time be of permanent usefulness in furnishing consumers with a genuine article of healthful acetie acid to take the place of the poisonous stuff now in general use.

HOW TO MANUFACTURE YOUR OWN VINEGAR ON A SMALL SCALE.

The recent manufactures of ethers by chemical process to resemble the aroma of fruits and the boquet of wines has afforded unscrupulous persons an opportunity of practicing deception to an inconceivable extent in the manufacture and sale of adulterated vinegars. To persons familiar with or accustomed to handling a pure article of fine vinegar the fraud will be readily detected; but the imitation is so perfect that the only safe course for the consumer in many cases is to manufacture his own vinegar, the process of which is as simple as it is complete.

Purchase, if you do not have it yourself, a barrel of sweet, rich juice made by a reliable man from sound, ripe apples; get a good iron-bound barrel, paint it well with two coats of white lead and boiled oil; purchase ten or fifteen gallons of pure, strong, cider vinegar, and put it in the iron-bound cask; place both casks in the cellar or other convenient place, with faucits in each and bungs out. After the juice has thoroughly fermented and settled, commence putting the cider into the vinegar cask; a good rule is to put in twice the quantity and as often as you draw out the vinegar. Thus managed, you will, in a reasonable time, have a full barrel of vinegar equal to the original, and need have no further trouble about not having always at hand an abundance of pure, rich, healthy, high-flavored, aromatic vinegar.

WINE VINEGAR.

This is a distinct kind of acid vinegar and perhaps is entitled to be classed by itself in contradistinction to that manufactured and sold as cider vinegar. But it is manufactured (in this country particularly) only on a very small scale, and is in no sense equal to cider vinegar, lacking all the requisites so desirable in that article, but by being called wine vinegar some persons may labor under the impression that as wine is generally esteemed higher than cider, so ought the vinegar to be better. The facts, however, do not justify any such conclusion. Aside from this, the consumer is peculiarly the victim of imposition, for when it is recollected that the price of the poorest wine is much higher than wine vinegar is sold for, a moment's reflection will discover the fraud. It is enough to say in this connection that it was facetiously remarked by a shrewd chemist "that diluted oil of vitrol made the finest *white wine vinegar* in the world!" This is well understood to be the article generally used in putting up fancy pickles in glass packages, so extensively sold in market, to the destruction of the stomach and teeth of the consumer.

WHY DOES VINEGAR SOMETIMES PUTRIFY?

Cider vinegar never does putrify. The older it gets the more body and the stronger it gets. But all vinegar manufactured from acids is composed of course almost entirely of water. It has neither body or substance, and is therefore liable to putrifaction, which frequently occurs. As so large a portion of the manufactured vinegar is composed of water, and as some persons *will* use it, it becomes highly important that the water should be entirely pure. But what assurance have we that it is so. On the contrary, may we not have serious apprehensions on the subject. Pure rain water well filtered is alone fit for the purpose—so vinegar authors and patent receipt venders say. But how often, let me ask, is it used in that form? Most if not all of the chemical factories are located in large cities, hence we may reasonably infer that much of the water used is very far from being pure rain water, much less filtered. And may we not also have good reason to suspect that at least a portion of the water used if not absolutely filthy, as is alleged, contains organic matter that causes the vinegar (as it is called) to putrify or become infested with "*vinegar eels*" and other "creeping things," rendering it as unfit to be taken upon the stomach as bacon infested with the *trichina*. Add to this the fact, that those who would manufacture vinegar out of poisonous drugs, would not be apt to be scrupulously particular about what other materials were used in its manufacture, and you may have *some* reason to fear that it may not be in *all respects* a healthful condiment or beverage.

It is a well known fact by all grocers and other dealers in vinegar, that the only vinegar that will stand the test of all degrees of temperature is cider vinegar. One of the largest grocers in our city informed me that they lost a number of barrels of "*acid*" vinegar on one occasion by the frost of a single night. It was bought for "pure cider vinegar," and so branded upon the heads of the barrels, but when it thawed out it was simply *putrid water*. I hear of several other wholesale and retail dealers who have suffered in a similar manner, in fact it appears to be well understood among dealers of very common occurrence. It is proper to say perhaps that all vinegar manufactured from drugs, acids and other foreign substances, although becoming flat and insipid by freezing and thawing, will not, if kept in a cool cellar, always become at once putrid Good cider vinegar will stand any extreme of heat or cold. I care not how much or how often it is frozen it will never change its character into anything else.

HOW TO KNOW PURE CIDER VINEGAR.

If tests of taste fail, its *aroma* will not. A peculiarly rich and agreeable aromatic odor is always observable in all *rich* pure cider vinegar when drawn from the cask. To imitate this fragrance so pleasant to the smell (hence so desirable to cover up the frauds of poisonous compounds) a few drops of fusil oil is added to give it odor, and burnt sugar and other substances to give it color; thus every device that ingenuity can suggest by calling in the aid of chemistry is resorted to to make "*pure cider vinegar*" out of anything and everything else but *cider*.

The fact that all acids manufactured are palmed off as cider vinegar ought to be sufficient to satisfy the most stupid that nothing but the juice of the apple was ever intended or should be used to any considerable extent for vinegar, since it is the only fluid that will of itself and without the aid of artificial means make an acid that is agreeable to the smell, grateful to the taste and healthful to the system, and which at the same time defies the skill of chemical science to successfully imitate This aroma is produced from a sweet smelling ether, present in all apples, but far more abundant in some than in other varieties. So perceptible is the fragrant oil in the skin of the Northern Spy, Rambo and many other sorts, that the opening of a single barrel after a few days confinement will scent the whole house in a few seconds. It is this peculiar quality that is so charmingly brought out in the acetous fermentation when undergoing the chemical change from cider into vinegar.

From Agricultural Reports.

REPORT OF THE ENTOMOLOGIST.

INSECTS AND THEIR USES.

Some people look upon all insects as injurious, while the truth is that many of them are the best friends that the farmer has, and instead of preying upon his crops, they are busily employed during their brief existence in riding his fields, orchards and gardens of other insects which are really destructive. It is, therefore, of the greatest consequence to be able to discriminate between friends and foes—to know which to kill and which to spare. Also, in the economy of nature, insects are of great importance as food for birds, fish and animals, which in their turn become food for man. The caterpillar is devoured by the carabus or an ichneumon fly; these are eaten by insectivorous birds, which either serve us as food or enliven our gardens and groves with their melodious songs. Without insects, these birds could not exist; and, although they are not absolutely necessary to human existence, it must be acknowledged we should miss their songs and their cheering presence.

Fishes also live almost altogether on animal food. The gnat or mosquito is taken from the surface of the water by the minow, and this in turn is swallowed by some trout or pickerel, which next makes its appearance as a great delicacy upon our table. Several animals eat insects, and, as will subsequently be shown, man himself has been glad to accept them as an article of diet, both in the Old World and the New. Insects are also of great use in the fructification of plants and trees by conveying the pollen from one flower to another, especially where the plants are too far apart for the pollen to be wafted by the wind. Observe in the spring how flies, bees, and other insects, dive into the flower-cups, and having feasted on the nectar within, emerge covered with the fecundating dust or pollen, which they deposit on the pistils of other plants, fertilizing and making them fruitful, when, perhaps, if left to the chance of winds, they might prove seedless and barren.

Insects are very useful as scavengers in removing decayed vegetable and animal substances, which would otherwise taint the air and cause sickness. Linnæus states that three flesh flies and their descendants would eat up a dead horse much sooner than a lion could; and we all know how soon a putrid carcass is removed by maggots, which are the larvæ of large flesh flies. Water larvæ purify the element they live in by devouring the smaller animalculæ and the vegetable matter always abounding in stagnant water, and which would otherwise create a noxious atmosphere. Linnæus says, "This will readily appear if an experiment be made by filling two vessels with putrid water, leaving the larvæ in one and taking them from the other; for that with the larvæ in will be found pure and without smell or bad odor, while the other will remain foul and putrid smelling." See also a well kept aquarium, in which the exact balance has been kept between vegetable and animal life, and the water will be found perfectly clear and free from minute confervæ.

Some insects are of great utility in the arts, for medicinal purposes, for dyes or coloring matter, and in producing silk. These may be noted as follows:

The honey bee (*Apis mellifica*) yields wax and honey. Many other varieties are known besides the common bee of this country. Kirby and Spence state that in Madagascar the *Apis unicolor* is domesticated, and produces a greenish honey. *Apis Indica* is cultivated in India, and *A. adansonii* in Senegal. The Egyptian bee, found also in Syria and Arabia, (*Apis fascicata,*) is one-third smaller than our common hive bee, which it resembles, but has the corselet and shield yellow. This bee was successfully introduced into Germany in 1863, and carried from thence to England in 1866, the present year. Fabricius thinks that other bees in the East and West Indies (*Apis acraensis*, *laboressa*, *&c.*,) might be domesticated with greater advantage than even our common honey bee. This, however, is to be doubted, as the insects would probably die from the effects of our cold winters.

The Rev. J. Fletcher, in his "Brazil and the Brazilians," gives a list of fourteen different species or varieties of Brazilian wild bees which produce honey; some of this honey, however, is quite sour, but the majority of it is good and sweet. Most of these bees are very small and stingless. He mentions, also, (in the same note), two kinds of wasps which produce honey.

A section of a hollow tree containing a swarm of stingless bees (*Trigona*), from South America, was placed in a sheltered position in the propagating garden of this department; but the bees exhibited very little energy during the summer, and in autumn gradually died off, leaving the trunk with only a small quantity of course, dark wax, and no honey at all, in it.

The Italian bee (*Apis ligustica*—Spinola) has, however, been recently introduced, and promises to be a valuable acquisition to this country. The bees are said to be more laborious and less inclined to sting than the common bee, from which they may be distinguished by broad orange rings on the base of the abdomen. The *American Bee Journal* of this year (1866) states that "those workers are pure whose first three abdominal rings are bright orange or buff, the first being slightly, the second more strongly, and the third broadly, bordered with black." The queen is more fully and more brightly colored than either drones or workers. Her abdominal rings have scarcely a perceptible margin of black; those in which the orange color is greatly wanting are degenerate, having a portion of common or black blood.

Bees are frequently termed by the western Indians the white man's fly, as the common broad-leafed plantain is called by them the white man's footstep: both making their appearance as civilization encroaches upon the Indian hunting grounds.

A species of ant in South America also produces a kind of honey, or sweet substance so called. The abdomen of the insect is distended like a small pea, and in it the honey is secreted. The ant, however, must be crushed so as to rupture the body before the honey can be obtained.

The culture of bees, in some countries, is very extensive and profitable. In the Ukrain, it is stated by an old author, some peasants possess from 400 to 500 beehives; and Niebuhr states that on the Nile, between Cairo and Damietta, he fell in with a convoy of 4,000 hives, which were being transported from a region where the season of flowers was past to one where the season was later. Many other nations transport their bees from place to place to find more abundant food for them. A great amount of honey is made in this country, but large quantities are also imported from the West Indies and other places.

Wax is not gathered from plants by the bee, but is produced by secretion in the form of small scales, which exude from between the rings of the abdomen. This fact was discovered by Hübner, who fed a swarm of bees exclusively on honey and water, and found that they formed a comb consisting of wax. White wax is common wax bleached by exposing it in thin slices to the combined influences of light, air, and moisture, after which it is re-melted and run into moulds. Wax is also produced by other insects. The female of the *Coccus cerifera*, or wax insect of China, makes a secretion of that nature for the protection of her young. This wax is not common as a commercial product.

The cochineal insect is well known as producing dye or coloring matter. It is a native of South America, where it lives upon the nopal, a species of prickly pear, but in other countries feeds upon a variety of other plants of the cactus family. The male alone has wings. The female is wingless, and attaches herself to the leaf upon which she feeds. Cochineal, as imported, is in the form of little shrivelled grains, covered with a whiteish bloom. These are merely the dried bodies of the female insects, which have been killed by boiling water, or by oven or stove heat. Those killed by dry heat, and having the most white powder on them, are said to be of the best quality. It has been calculated that it takes 70,000 of these small insects to make a pound. This useful insect was introduced into Gaudaloupe and St. Domingo in 1809, and in 1826–'27 to Cadiz, in Spain, and to the Canary Islands. It is reported to have been introduced into Florida, near Fernandina, some years ago; but in 1855 no traces of the insect could be discovered. Leunis states that, in 1850, 800,000 pounds of rough cochineal were imported from southern Spain to England; and, in 1856, the product of the Canaries is estimated at 1,500,000 pounds, having increased to that figure from eight pounds in 1831. In 1865, 807,646 pounds were imported into the United States, the value of which was calculated at $343,668. Cochineal has been introduced into Algeria, where it is said to succeed very well. As a dyeing material, this article has lately been somewhat supplanted by the aniline colors, an organic alkaloid obtained from coal-tar. Carmine is prepared from the cochineal.

It was thought at one time that the Southern red bug, or cotton-stainer, (so called from its beautiful red color,) was capable of producing a brilliant dyeing material, and experiments were made by an able chemist; but it seems to have proved worthless. Before the true cochineal was introduced into Europe, another insect, the *Coccus ilicis*, known also as the *chermes*, was used for dyes. It was found upon a small species of evergreen oak, common in the south of France, Algeria, and on the shores of the Mediterranean. This insect also produces a blood-red or crimson dye, and it is said that the imperishable red colors of Brussels and other Flemish tapestries are procured from it. The grains or balls do not resemble cochineal, but are more like small galls. The insect forms for itself a small cocoon, in which its eggs are deposited, and it is the whole mass of this cocoon which constitutes the *chermes* of commerce.

Another insect, the *Coccus polonicus*, is very abundant in Poland, and is extensively exported from that country into Turkey, where it is used for dyeing red. This insect feeds upon a species of polygonum, a plant of the buckwheat family.

Lac is the product of an insect, the *Coccus lacca*, which feeds upon the Indian fig, *Ficus indica*, and the *Ficus religiosa* or sacred fig. Gum lac is gathered in large quantities from these trees, and from other trees also. The female insect is wingless, and generally attaches herself to the bark of the branches. In making the little puncture to fix herself to the spot, a great quantity of vegetable matter exudes from the wound, and eventually surrounds the insect, her eggs and larvæ producing on the branch an irregular broad mass, which, when broken, presents a resinous appearance. This is the gum lac of commerce. Stick lac is the resin as taken from the tree, still incrusting the small twig around which it was formed. Seed lac is the small pieces of the broken resin. White shell lac is made of the broken lack, softened in hot water and pressed into thin flat cakes. If stick lac be broken and examined minutely, in the middle of the resin will be discovered the body of the dead insect, and in the little holes produced by this body, a minute drop of red fluid, which, being extracted, constitutes the lac dye. It is brought into market in the form of hard cakes, of a dirty purple color, which are used for scarlet, carmine, and other red dyes. Upwards of 1,500 tons of dye and resin are annually imported into England from the East Indies. In 1865 the amount of lac, seed lac, and stick lac imported into this country was 36,117 pounds, worth $3,554; and of lac dye, &c,, about 257,000 pounds, worth $43,041.

Shell lac, dissolved in alcohol, forms an excellent coating for amputated branches and for wounds of fruit trees, making a waterproof artificial skin, under which the wood grows till the wound is healed. Lac is also used to stiffen the bodies of hats before the silk is put on; but its greatest use at one time was for making sealing wax, which is done by mixing it with Venetian turpentine, a little Peruvian balsam, and then coloring with vermilion.

The Spanish blister fly, *Cantharis vesicatoria*, an insect feeding on the ash, lilac, rose, and poplar, is found in Spain, Italy, France, Russia, and also in the west of Asia. Those from Russia are considered the most valuable, and may readily be distinguished from others by their great size and by their color, which approaches that of copper. These insects make their appearance annually in May or June, and are collected from the trees and killed by plunging them into diluted vinegar, or exposing in seives to the vapor of boiling vinegar and then drying them. When perfectly dry, they are packed in casks or boxes, lined with paper, and kept as much as possible from moisture and exposure to the atmosphere. There are several native species of cantharides in this country, which, according to the United States Dispensatory, have been used as substitutes for the *C. vesicatoria*, and found to be equally efficient. These insects are generally known as the potato insect. They feed in swarms on the foliage of the potato, sometimes destroying whole fields in a few days. These might readily be gathered in scoop nets of muslin, and, if a market could be found, be made profitable, at the same time destroying a public pest. *Lytta vittata*, or striped potato fly; *L. cinerea*. ash colored; *L. marginata*, or margined; and *L. atrata*, or black potato fly, are the most common and most destructive. The Dispensatory also speaks of *Lytta nuttali* as bidding fair, at some future period, to become an object of much importance to the western country, as on the plains of the Missouri it was found by Major Long's party to be so numerous, feeding upon the scanty grass, that they were swept away by bushels in order to clear a place for camping. It is said to surpass the Spanish fly in size and splendor, being quite a large insect, with the head of a deep green color, thorax golden green, and wing-cases red or golden purple. Those in the collection of the museum, however, vary much in color, but are all more or less of a golden green metallic hue on the head and thorax, and a beautiful red or copper tint on the wing covers. Lancaster states that from 30,000 to 40,000 pounds of blister flies are imported into England every year.

The galls of commerce come to us in the form of small round balls, of a dark color, and varying in size from a pea to a marble. These galls are produced by a small membranous-winged fly, *Cynips quercifolii* of Linn., or *Dislolepis gallæ tinctoriæ* of Geoffrey. This insect or gall-fly pierces the shoot or young bough of a small oak, and deposits an egg in the wound. It is thought that a peculiar fluid is instilled into the puncture which irritates the part; the egg, also, growing within the gall or excrescence, becomes a footless white grub, the true larvæ of the gall fly. It feeds on the vegetable matter around it, thus forming a cavity or oval cell inside of the excrescence. After some time the larvæ changes to the pupa, and finally emerges a perfect gall fly from a hole gnawed through its covering by the insect itself. It then punctures a branch or leaf, lays its egg, and dies. Those galls are most valued which are without holes, as then the fly has not escaped. These are called blue, green, or black galls, while those which have been perforated by the insect are less valued, are gathered later, and are called white galls.

Galls are imported principally from Smyrna and Aleppo, by which latter name they are usually known, although they are also imported from many other places. They are used in coloring black, and form one of the principal ingredients in making ink.

For writing-ink the Aleppo galls are well bruised, and macerated with water, gum-arabic, and loaf sugar, with sulphate of iron and green copperas crushed, and all together left for some time before use. In 1850, upwards of 270 tons of oak galls were brought to the British market, aside from those imported from other places. It is probable that many of the galls found growing on our native oaks might be used for the same purposes. Our native gall flies, however, are attacked by numerous parasitical hymenopterous insects, which deposit their eggs in the larvæ in the gall. These eggs become grubs, devour the rightful possessor of the gall, and then make their exit as winged flies, to lay their eggs in other gall insects. Any amateur naturalist may easily satisfy himself that galls are produced by insects if he will open one of the excrescences growing on our native oaks. A small whitish worm will be found in the center. This is the larvæ of the gall fly. If a perfect gall be preserved in a state of proper warmth and moisture, the flies will make their appearance. Galls are frequently found on many other trees, and on shrubs and herbaceous plants. The common blackberry is, in some places, particularly subject to them.

Silk, another important article of commerce, is produced by the caterpillar of a small, insignificant looking moth, (*Bombyx mori*). It is said by some that this insect is a native of China, but Leunis states that it originally came from the province of Serica, in southern Asia, where, in autumn, the female lays from three to five hundred eggs upon the body of the white mulberry tree. It is claimed that the silk culture was known as a branch of industry in China 2,700 years before the Christian era. It then spread to Thibet, and was afterwards made known to the Greeks through their wars with Persia. It is said that these insects were first introduced into Constantinople by two Nestorian monks, in 555. A reward having been promised for the worms which produce silk, these monks secreted some of the eggs in a hollow cane; this was at the risk of their lives, the penalty for exporting them from

China at that time being death. Henry IV introduced silk culture into France, in 1601, and Frederick the Great into Prussia in 1700.

The natural history of the silk-worm is much the same as that of several of our common native moths. The eggs are hatched by the heat of the atmosphere, or sometimes by artificial warmth. The young worms are at first of a dark color; they feed upon fresh leaves of the mulberry, and shed their skins three or four times while growing. When fully grown, they spin a loose, flossy web, in the center of which the cocoon is afterwards made. Two fine threads, issuing from two small openings near the mouth, are glued together by a sticky matter resembling silk itself, which is produced from two smaller glands very near the others. The caterpillar turns over and over in the middle of its web, spinning the thread around itself till the perfect cocoon is formed. Those which gradually contract towards the center, in the shape of a peanut, are considered the best cocoons for making silk. They vary much in color, according to the variety of the worm, some being perfectly white, others yellow, buff, or of a greenish tinge. These last are from Japan, and were, together with several other varieties, presented to the department by M. Guerin Meneville, of Paris. The worm, after perfecting its cocoon, changes to the chrysalis form within it, and in a few days works its way out in the moth state, after which it pairs, lays its eggs, and dies. The cocoons, thus perforated by the moth, are valueless for the purpose of reeling, and are often stained by a dark fluid, discharged by the insect at the time of its escape. They are called "knubs," or "husks," and may be carded and spun like wool. The inner surface of the cocoon consists of a gummy matter, and can not be reeled or used as silk. To prevent the moth coming out, the cocoons are baked in an oven, or scalded in boiling water. Mr. Prevost, of California, states that exposing them three days to the heat of the summer sun in that climate kills them.

The article used by anglers, and known as "silk-worm gut," is the silk bag before being spun. The worm, when ready to make its cocoon, is put in pure vinegar for some hours, after which it is cut open and the silk bag taken out, stretched, and dried. This is the silk gut of the shops.

As the silk-worms are often hatched before the leaf of the mulberry is out, European authorities advise feeding them on lettuce and dandelion leaves, but say they never make as strong and healthy worms as those fed entirely on mulberry. The *Morus alba*, *Morus multicaulis*, and *Morus moretti*, (see Mr. Prevost's Silk Grower's Manual, California,) are the best food; but, in the museum of the Department of Agriculture, some worms were fed entirely on leaves of the Osage orange, *Maclura aurantiaca*, and were healthy, and made excellent silk, although little attention was paid to them.

The length of one thread, when reeled from the cocoon, is said to vary from 300 to 800 yards. Lancaster places it at 1,526 feet; some authors make it much more. One ounce of eggs is calculated by Clarke to produce 26,650 worms, which will make 106 pounds 9 ounces of cocoons, the silk of which, when reeled off, will weigh 10 pounds 10½ ounces. These calculations, however, will vary according to the variety of the worm cultivated.

The principal disease affecting the silk-worm, and often destroying millions of them, is called the muscadine, and is a fungoid growth or mould (*Botrytis bassiana*), which forms in the interior of the worm, and afterwards appears on the surface—

though not observable till after death—and sometimes not even then, if the skin of the caterpillar is very dry. A similar disease affects the common house fly, which may often be found dead and fastened to the window glass enveloped in a whitish mould. In the silk-worm the disease is caused by over-crowding, and by filth and insufficient ventilation. Lancaster states that, in France, feeding the caterpillars with sugar prevents the disease; others recommend sulphur and chloride of lime. Burning all the refuse leaves, dead caterpillars and filth, might be of use.

The average imports of silk into England from 1856 to 1858 were, annually, 7,000,000 of pounds. In 1840, 2,205,000 pounds were consumed in Lyons, a silk manufacturing town in France. In 1865, $16,597,980 worth of silk was imported into this country; this amount has, probably, been doubled since. The culture of silk in this country appears to excite little attention at present, owing to the high price of labor. Mr. Prevost, of California, however, states in his Silk Grower's Manual that the business is making some progress there, the climate being peculiarly favorable to the growth of the silk-worm. He has a growing plantation of 2,500 mulberry trees.

There are several large moths, natives of this country, the caterpillars of which would probably produce silk, namely: *Attacus* (*Telia*) *polyphemus*, *Attacus* (*Collosamia*) *promethea*, and *Attacus* (*Samia*) *Cecropia*. The first named has been experimented with by Mr. Trouvelot, of Medford, Massachusetts, who states that in 1865 he had not less than a million of the caterpillars feeding upon bushes covering five acres of ground, and protected by net-work. Of his success or failure in silk-making we have no account.

Our common basket-worm, *Thyridopteryx ephemeræformis*, which feeds indiscriminately upon all decidous trees, and in the neighborhood of Washington appears to be particularly partial to the red cedar, might be used for silk, provided the fragments of leaves and sticks interwoven with the outer surface of the cocoon could be readily separated from the fibre. The silk, however, would have to be carded, as it would be impossible to reel it.

In the Department museum is a very large cocoon, or rather a mass of cocoons in one, the work of moths found on the Ithmus of Panama, and which might be made useful. This cocoon is about eight inches long, by six and a half in its greatest breadth; it is brownish white in color, somewhat triangular in shape, and consists of a thick, parchment-like covering, inside of which are layers of very fine silk, enclosing a mass of cells or cocoons of some gregarious caterpillar, the dead chrysalides of which are still within.

Kirby and Spence mention "ovate nests of caterpillars on the Psidium eight inches long, of gray silk, which the inhabitants of Chilpancingo and other places in South America manufacture into stockings and handkerchiefs." Humboldt observed great numbers of similar nests of a dense texture resembling Chinese paper, of a snowy whiteness, in the provinces of Mechoacan and the mountains of Santa Rosa, at the height of 10,500 feet above the sea. They were on the arbutus and other trees, and were composed of distinct, separate layers, the interior being the thinest and very transparent. The silk of these nests, which are the work of the social caterpillar of a *Bombyx* (*B. Madrôna*), was an object of commerce even in the time of Montezuma, and the ancient Mexicans pasted together the inner layers to form a glossy white pasteboard, which may be written on without preparation. Handkerchiefs are still manufactured from it in the "Itendancy of Oaxaca." W.V.Wells also mentions a somewhat similar insect in his explorations in Honduras. He says: "There is also an indigenous silk growing wild among the trees of Olancho, in Central America, the production of a species of silk-worm, constructing a large bag two feet in depth. Depending from trees in the open savannas, at a distance, the nest resembles a huge matted cobweb. A few pounds sent to England was made into handkerchiefs, not easily detected from common silk, of equal strength and delicacy." And the writer adds, "that a profitable trade in this might be established, as it can be had in any required quantity simply for the trouble and expense of gathering." He also says that there is found in South America a very curious silk-producing spider.

Mr. Wilder, of Massachusetts, has published the discovery of a silk-producing spider in South Carolina, which he thinks might prove very valuable, if cultivated. It is hoped that his experiments may lead to some practical results.

All spiders produce a very strong, fine silk; but the trouble hitherto has been to prevent them from devouring their fellow-captives when in confinement, especially if kept without food for any length of time.

We have received no report as yet of the *Attacus cynthia*, or ailanthus silk-worm, being cultivated as a silk-producing insect with success in this country, although it appears to have been perfectly acclimated, and to have bred on the ailanthus tree in the wild state, from specimens which had escaped from confinement.' The other foreign silk-worms (specimens of the moths of which were presented to the Department of Agriculture by M. Guerin Meneville, of Paris, namely, *Bombyx* (*faidherbia*) *bauhiniæ*, from Senegal—food plant bauhinia; *Bombyx* (*antheræa*) *pernyi*, from China; *Bombyx yama mai*, from Japan—food, oak; and *Bombyx mylitta*, from Bengal;) have not been tried her yet, and it is doubtful whether they would prove any better than our native Polyphemus of Cecropia, if as good.

The great trouble with any silk-producing insect, raised in the open air without protection, is from the attacks of cats and insectivorous birds. Several persons who have tried the *Attacus cynthia*, and who succeeded in hatching the eggs, state that the birds destroyed nearly all the worms before they had attained their full growth. Nets over trees might keep them off, but the cost would very much diminish the profits of wild silk culture.

The manna of druggists is the concrete juice, in flakes, of the *fraxinus ornus*, or flowering ash, and several other trees. Many authorities state that it is produced by the puncture of a cicada or harvest fly, or, as incorrectly termed in this country, the stinging locust, which bores into the twigs, starting the sap, which hardens as it flows out, and is then gathered as the manna of commerce. The same effect is produced by artificial incisions made in the bark of the tree.

As food for man, insects are of very little utility; yet they have been eaten, both by the ancients and moderns. Pliny tells us that the cossus, the larvæ or grub of some large beetle, was fatted with flour and esteemed a great delicacy; and even at the present time, the grugru, a large, fat worm, feeding on the palm trees in the West Indies, is said to be delicious if properly cooked. Locusts, or large grasshoppers, are still used as an article of food by many of the African nations. One author speaks of wagon-loads of locusts being brought into Fez, as a usual article of food. Another states that they are used by the Arabs when there is a scarcity of food. "As a substitute for corn, the Arabs would grind up locusts in their hand-mills, and make cakes of the dough." Our western Indians also use the locust, or western grasshopper, as an article of food, first singeing off their wings, and then, after roasting them in large quantities, pounding them between two stones, and making a kind of dry cake, which is said to be very nutricious.

M. Guerin Meneville, of Paris, presented to this department specimens of the eggs and insect of *corixa femorata*, a water beetle of Mexico, the eggs of which are said to be gathered from the water plants, and used as an article of food by the dwellers near the lakes where they abound. The natives cultivate, in the lagune of Chalco, a sort of carex, called *tôute*, on which the insects deposit their eggs very freely. This carex is made into bundles, which are removed to the lake Texcuco, and floated in the water until covered with eggs; the bundles are then taken out, dried, and beaten over a large cloth. The eggs being thus disengaged, are cleaned, sifted, and pounded into flour. The Chinese, after having unwound the silk from the cocoons of the silk-worm, cook and eat the enclosed chrysalides. White ants, or termites, are also eaten by many savage nations. The above examples are merely given to show that, although contrary to our ideas of taste, insect food has been, and is yet, used by many savage or half-civilized members of the human race.

We shall now turn our attention to the insects which are the direct benefactors of the farmer, inasmuch as they destroy others that injure his crops. Though unseen and unnoticed by him, they are ever waging war with caterpillars, cut-worms, plant lice, and many other foes to the horticulturist. Almost every noxious insect has its own peculiar enemy in some other insect, which either feeds upon or makes its live body the receptacle for eggs, and the future nest and larder for its young brood. Among the beetles, (coleoptera,) the cicindela or tiger beetle stands pre-eminent for its carnivorous or insect-destroying propensities. Any farmer must have observed small, brilliant-colored, nimble beetles, on dry sandy roads or paths, continually flying a short distance when approached, and again settling down several yards ahead; these are tiger beetles in the perfect state. The larvæ forms a round hole in the earth, rather larger than a quill, and lies hidden in it until some passing insect falls into the trap, when it is immediately seized by a pair of powerful jaws and its juices sucked out. It may be readily ascertained whether the hole is untenanted or the larvæ is "at home," by introducing a straw or stalk of grass. If the insect is in, it seizes the intruding straw and assiduously endeavors to push it out, thus causing the stalk to move; when, if drawn quietly out, the larvæ may be brought up with it. The *Calosoma calidum*, a large carabus of a dark color, with several rows of hollow, burnished, copper spots upon the wing-cases, is exceedingly useful in destroying caterpillars, grass worms, and other insects, both in the larvæ and perfect state. When the grass or army worm was extremely abundant in this neighborhood, a few years ago, the larvæ of this beetle, or of *C. scrutator*, were found in large numbers feeding upon them, gorging themselves in such a manner as to be almost unable to get out of the way. If kept without food for some time, they will devour each other; and whenever they find one of their own species so filled with food, as to be inactive, they have no hesitation in catching and destroying it. *Calosoma scrutator* is said to be very useful in destroying the caterpillar of the canker worm, (*Anisopteryx vernata*,) so destructive to the orchards in the eastern States. The smaller species of *Carabidæ* live in flowers, and most probably devour insects frequenting such places. The *Cleridæ* feed upon insects found in or upon wood. The *Necrophorus*, and other allied insects, are useful in removing decayed and putrefying animal matter, acting in some degree as the scavengers of the insect tribe. The European *Silpha* is said in Europe to destroy other insects. The *Staphylinidæ* are ever hunting about for prey. They are insects of an elongate form, having very short wing-cases, found running on the ground, and when disturbed or alighting, they have the habit of curving up the end of the abdomen. The water beetles and their larvæ feed upon the larvæ of mosquitos, gnats, etc. The *Cantharides*, as before stated, are of great value for medicinal purposes—making blisters, etc. All the *Coccinellidæ*, or lady-birds, (excepting *Epilachna borealis*, which is one of our largest species,) are beneficial by destroying plant lice and scale insects. They deposit their eggs in the midst of the aphides, and when hatched, the young larvæ immediately commence feeding varaciously upon them, and continue to destroy them until they change to the pupa state; then they remain motionless fastened to a leaf or branch until they again change to the perfect insect—in this stage to feed on other insects and propagate their species. *Chilocorus bivulnerus*, a small black lady-bird, with two red spots on its wing-covers, is very useful in destroying bark lice, which are so injurious to fruit trees. I have observed them early in spring attacking the pine tree scale, ripping open the cases and devouring a few of the eggs, leaving the rest to fall to the earth when the trees are agitated by the wind, in this way destroying many of this injurious coccus. *Exochomus quexi*, a small red lady-bird with two black spots, is of similar habits. It is of great utility, by destroying the orange scale insect, which has proved so very destructive to the orange tree in Florida. If any farmer wishes to satisfy himself as to the utility of the lady-bird, he can easily do so. By minutely examining his rose bushes in the summer, when covered with lice, he will find an elongate blueish-black insect, somewhat resembling an alligator in shape, with more or less orange or yellow spots on the back and sides. This is the larvæ of a red or black-spotted lady-bug, and if placed under a tumbler with a fresh twig of the plant covered with plant lice, after a few days it will cease eating, fasten itself to a leaf, shed its skin, and assume the pupa state; and in a few days more change to the perfect insect.

Almost all the *Orthoptera* (grasshoppers, katydids, etc.,) are injurious, with the exception of the *Mantis carolina*, commonly known in the middle States as the rear horse. The female of this singular insect, in the autumn, deposits her eggs clustered together, enclosed in an irregular brownish mass, or case, upon the trunks or branches of trees. When the young insects escape from the eggs in the spring, they are so voracious that the stronger ones frequently eat the weaker. They catch their prey my means of the fore legs, which are armed with spines, closing them together like the blade of a knife, thus impaling the unfortunate insect, which is soon devoured. The insects have been successfully raised as far north as the Hudson river, by bringing the egg-cases from the middle States, several cases being found fastened to the trees next autumn, but after that they disappeared entirely.

Mr. Walsh says of the common thrips: "They are generally, if not universally, insectivorous," and that "those occurring on the ears of wheat, both in the United States and Europe, are preying upon the eggs or larvæ of the wheat midge, *Diplo. sis* (*cecidomyia*) *tritici*, and are consequently not the foes, as has generally been imagined, but the friends of the farmer." They are said, however, by gardeners, to be injurious to plants in greenhouses.

The *Neuroptera*, or insects having four wings with netted veins, are almost all friends to the farmer, both in their larval and perfect states, by destroying other insects which are injurious. We will notice first the dragon fly, commonly known as the mosquito hawk or darning needle. The larva of this insect lives in the water, and feeds altogether upon other water insects or land insects which chance to fall into the water it inhabits. The perfect insect is exceedingly voracious, and may be observed on warm summer days hovering over the water or suddenly darting off in pursuit of any insect it has discovered, which, when caught, is carried to some tall water plant and there leisurely devoured. Among insects they may be compared to the hawks among birds, both in their easy, swift, and graceful flight, and as they live entirely by rapine and murder, carefully avoiding any vegetable diet, and feeding only upon the bodies of their fellow insects. The water flies and their larvæ (*Phryganea*) serve as food for innumerable fishes. The larvæ of *Hemerobius* and *Chrysopa* live mostly on the plant lice which are so destructive to young shoots and leaves of the hop, grape, rose, etc. The eggs are placed on long pedicels on a leaf among the plant lice, and present the appearance of very minute balls, each at the end of an extremely fine hair, and have frequently been mistaken for microscopic fungi. The larvæ feed upon the plant lice, sucking out their juices, then casting away the empty skin.

The perfect insect of the *Chrysopa*, or lace-wing fly, is of a beautiful light green color, with delicate gauze-like wings, and eyes like golden balls. Some of them when crushed in the hand give out a most nauseous odor. The ant-lion is very interesting to observe, as it catches its prey by constructing artificial circular pitfalls in sandy places, in the shape of a cone, at the bottom of which the larvæ lies hidden in the sand, ready to seize with its powerful jaws any insect which unfortunately falls in. When this happens, the insect is dragged under the sand to prevent its struggles, and there devoured, after which the ant-lion comes out to cast away the empty skin, (always at some distance from the pitfall,) or to repair any damages which may have been caused by the struggling captive, then again returning to await fresh victims. As a general rule, the order of Neuroptera is very beneficial to the farmer, doing very little injury to his crops, as, with few exceptions they feed on other insects.

The order *Hymenoptera* comprises four-winged insects which have the wings nerved and membranous, such as bees, wasps, ichneumon flies, etc. With the exception of some wood or foliage eating insects, such as saw flies, the goosberry worm, pear slug, &c., this order is very beneficial by destroying hosts of insects which otherwise would injure the crops of the farmer. Many of the ichneumon flies deposit their eggs in the larvæ of other insects. A single egg is deposited in the body of a caterpillar, for example, which hatching into a small, footless, whitish grub, devours the fatty matter in the interior of the worm, carefully avoiding the vital parts, sometimes leaving the caterpillar strength enough to change into a chrysalis, when it finishes by devouring the whole inside, or, in other cases, eating its way out of the weakened caterpillar before it perishes, either to spin a cocoon or to bury itself in the earth preparatory to changing into a perfect ichneumon fly, which again lays its eggs in other caterpillars. *Cryptus inquisitor*, a small, yellow-banded ichneumon fly, destroys the *Thyridopteryx ephemeræformis*, or basket-worm, which is so destructive to cedar and shade trees in the middle States. The white pine snout-beetle is destroyed by an ichneumon which deposits its egg in the body of the perfect insect. *Calandra* (*Sitophilus*) *oryzae*, or rice weevil, is destroyed by *Meroporus graminicola*. In Europe, in a similar manner, *Hippodamia maculata*, a small lady-bird, is attacked by small ichneumon fly, the larvæ of which, after feeding upon the interior of the insect, eats its way out, then making a cocoon between the dead body and leaf or branch to which it is attached, it changes first into a pupa, and then comes forth as a small four-winged fly. The cabbage moth, *Cerostoma brassicella*, (Fitch,) is destroyed by an ichneumon which deposits its eggs in the worm. The large, hairy caterpillars of the tiger moth, *Arctia* (*Pyrrarctia*) *isabella*, do not escape, although so well defended by a thick coating of bristly hairs; they are also destroyed by an ichneumon fly. *Cœnocilius ribis*, of Fitch, is said to destroy the destructive currant-borer, *Trochilium tipuliformis*.

The larch-cheater, (*Tolype laricis*,) a caterpillar devouring the foliage of the larch, is destroyed by a parasite (*Phrygadeuon planosæ* of Fitch) when in the cocoon, the egg probably being deposited in the caterpillar. *Papilio asterias*, the green caterpillar with black bands and orange spots, so destructive to parsley› celery, parsnips, and other umbelliferous and culinary plants, is destroyed by *Trogus exesorius*, a brownish-colored ichneumon fly, which, after devouring the interior, finally eats a large hole in the outer skin of the chrysalis, and makes its escape. *Sirex* (*Tremex*) *columba*, the larvæ of which bores into the wood of the pear and other trees, is destroyed by *Pimpla atrata* or *lunator*, a very large and singular ichneumon fly, having an immensely long ovipositor and borer, which looks like three bristles or hairs, some inches in length, issuing from the end of the abdomen. Several of these insects have been taken with their ovipositor so firmly inserted into the wood, when boring in search of their victims, which are found in the larvæ state, deeply buried in the trunk of the tree, that they have been unable to extricate themselves. The larvæ of small wood-eating insects, living between the bark and wood, are destroyed by *Ephialtes irritator*, a small ichneumon fly, the larvæ of which, after devouring the destructive wood-worms, form for themselves small, oval, paper-like cocoons, with flattened sides, in the burrows made by the former inhabitants. Another much smaller *Ephialtes* and *Bracon* may also be seen near wood-piles in the spring, evidently on the watch for some opportunity to deposit their eggs in wood-boring larvæ. *Attacus* (*Samia*) *cecropia*, one of our largest moths, is destroyed by the *Ophion macrurum*, a large, clay-colored ichneumon fly, the perfect insect of which makes its way, in the spring, out of a hole eaten through the tough, thick cocoon of the Cecropia. It frequently troubles young entomologists, who, instead of hatching out the moth they expected, are astonished to find a large hymenopterus insect in the breeding-box or cage. *Ophion bilineatus*, and almost all the larger ichneumons, also destroy noxious insects. Many of the smaller ichneumon flies (*Braconides*) destroy the larvæ of destructive beetles living under the bark of trees, and may be seen any fine spring day hoving around logs in wood-yards. Millions of the aphis, or plant louse, are destroyed by the larvæ of minute four-winged flies. *Aphidius* and *Trioxyx*, the perfect insect of which deposits a single egg in each plant louse, which, hatching into a grub, destroys the insect, then gnaws its way out through the empty skin. Any hop or grape grower can, by careful examination of the leaves most infected with the lice, satisfy himself in regard to this fact. He will find the empty skins of multitudes of the lice, which are of a dirty brownish color, adhering to the leaf, each with a round hole in the abdomen, through which the parasite has escaped. *Pteromalus*, a very small parasitic four-winged fly, is said in Europe to destroy the *Chlorips*, which is destructive to wheat. *Pachymerus calcitrator* (Europe) is parasitic on *Cecidomyia tritica*, wheat midge or red weevil, so destructive to wheat in this country, whilst another ichneumon, (also European,) destroys *Cephus pygmœus*, the larvæ of which lives in the stem of the wheat plant. The larvæ of *Chrysobothris femorata*, a beetle destructive to apple and oak wood, are destroyed by a small *chalcis*. The *Eurytoma hordei*, or joint-worm, although belonging to a family essentially parasitical, (insects preying upon other insects,) is said by many authors to be destructive to wheat, barley, &c., by forming hard knots or galls in the stem of the plants. This is doubted, however, by other entomologists, who state that it is merely parasitic upon another fly that causes the swellings. My own experience is that, although I have raised numbers of the true *Eurytoma hordei*, from diseased stems of wheat grown in Virginia, at the same time, and from the same stems, I merely raised two other specimens of parasitic hymenoptera, (belonging near the *Pteramalus*,) which had evidently devoured the grub of the true *Eurytoma hordei*, and no other insects whatever. A species of *Torymus* is also said to destroy the joint-worm. The much dreaded Hessian fly, so destructive to the wheat plant by injuring the stem, is destroyed by a species of *Platygaster* or *Pteromalus*, a very minute hymenoptera, which destroys it after it has assumed the pupa state, in which they spin little brownish cocoons, and in due time eat their way out as perfect flies. The *Chalcididæ* are minute four-winged flies, frequently of bright or metalic colors, and with elbowed attennæ. Some of the species deposit their eggs in the case or outer covering of the bark-louse, or scale insects of the apple, orange, and other trees. The larvæ, after feeding upon the eggs and body of the insect, makes its escape through a round hole gnawed through the outer covering of the scale itself. This was frequently found to be the case in Florida, upon examining the large, round, or oyster-shaped scale; but the oblong, attenuated scale, shaped like a long mussel-shell—which was the real cause of the orange blight, and has been imported with foreign orange trees—has never appeared to have any such parasite, and, therefore, multiplied so rapidly as to destroy whole groves. Galls on oaks also frequently produce small parasitical four-winged flies, instead of the true cynips, or proper owner of the gall, the larvæ having fed upon the rightful possessor. Some very minute parasites even pierce the eggs of other insects, and deposit their eggs therein; the larvæ produced from them, after devouring the contents, change into pupæ in the empty shells, and escape as a perfect insect. Small ichneumon flies are even produced from the egg of a heteropterous insect, or plant louse. The tobacco-worm sphinx (*Macrosila carolina*) is destroyed by a minute ichneumon, which deposits its eggs in the body of caterpillar; the larvæ live upon the fatter matter, and eventually kill the worm before it changes into the chrysalis; they then eat small holes in its skin, spin themselves up in small, oval, whitish cocoons, which frequently remain adhering to the skin of the sickly, dying caterpillar, until the change to the perfect insect, a four-winged fly. Another small parasite destroys the elm sphinx (*Ceretomia quadricornis*) in a similar manner; but the cocoons are agglutinated together, and look like the very minute cells of a species of bee. The lackey caterpillar, *Clisiocampa americana*, or *decipiens*, which forms cobweb-like nests in the forks of fruit trees, is attacked and likewise destroyed by another minute parasite, *Cleonymus clisiocampæ*. The vaporer moth, *Orgyia leucostigma*, is destroyed by *Trichogramma orgyiæ*, seventeen parasites having been taken from one insect. One *Acronycta* caterpillar killed by these insects has no less than forty-four holes bored into its dried skin by the grubs when making their escape. The young caterpillars of *Anisota* (*Dryocampa*) *senatoria*, so destructive to oak foliage, is destroyed by a small ichneumon, which deposits but one egg in each worm, the dried skins of which, each perforated with a small hole, may be seen by dozens attached to the leaf of the oak in the spring or early summer. Various species of butterflies are also attacked by these small ichneumon flies; and to show how destructive they must be, out of about twenty apparently healthy chrysalides of *Argaulis vanillæ*, taken from the rails of a fence in Georgia, only three or four changed into the perfect insect; all the rest, upon examination, having been killed by minute ichneumons. Some of these grubs, when they come from the body of their victims, make cocoons of a loose white web, which closely resembles a small piece of loose cotton fibres. Ants kill and devour any injured or crippled insects they can find, and have been observed in the south attacking, and even destroying, the healthy caterpillars of the grass army-worm. *Ammophila gryphus*, a large ichneumon-shaped fly, with extremely attenuated pedicel or foot-stalk to its body, which swells suddenly at the extremity, is often seen in September busily employed in carrying caterpillars to its nest, to form food for its young when hatched. Almost all the allied species have somewhat similar habits, and destroy multitudes of insects. *Larrada argentata*, a small wasp-like insect, was taken in the act of carrying off a cricket as large as itself, no doubt as food for its young. *Eumenes fraterna*, or the potter wasp, is said to fill her clay cells with canker-worms, (*Anisopteryx vernata*,) frequently collecting eighteen or twenty of these destructive caterpillars as food for her young larvæ. One of the common dirt daubers, which form clay cells under the roofs of barns and in other sheltered places, provides nothing but spiders for its young. After filling the cells with half-killed spiders for its larvæ when hatched, it closes the entrance with mud, thus leaving a supply of fresh food. The *Vespidæ*, or wasps, although they do destroy ripe fruit, at the same time act usefully in killing flies and other insects. The *Cicada*, or locust, is carried off by a large species of wasp, *Stizus speciosus;* and the tarantula of California is said to be destroyed by another wasp-like insect, in a similar manner.

The *Lepidoptera*, or butterflies and moths, are all more or less injurious to plants, shrubs, and trees, but only when in the caterpillar state. As butterflies, they live only by sucking the nectar of flowers, and do no injury whatever; but the caterpillars produced from their eggs do much injury to the crops. The silk-worms are the only species which are beneficial to mankind in the production of the silk of commerce.

Among the *Heteroptera*, or plant bugs, many may be found which are useful by destroying noxious insects, although the majority live upon the juices of plants, which they extract by means of their piercer, thus injuring vegetation very seriously.

Mr. Chapman, of Iowa, writes to the department that he has observed *Arma spinosa*, an insect generally considered injurious to plants, feeding with avidity upon the larvæ of *Doryphora ten-lineata*, or ten-lined spearman, the insect so destructive to the potato in the west. We have ourselves seen *Stiretrus diana*, a dark blue plant bug with orange yellow markings, killing the *Epilachna borealis*, a large, reddish-yellow and black-spotted lady-bird, which is so injurious to the squash vine foliage. *Reduvius novenarius* is a large and singular looking plant bug, of a grayish color, having a high semi-circular ridge on its thorax, armed with perfectly arranged teeth or protuberances, somewhat like the spokes of a wheel, hence also termed the wheel bug. It is constantly employed, from the moment it hatches from the egg, in destroying caterpillars and other insects, by first piercing them with its proboscis and then sucking out the juices. Their eggs are deposited in a hexagonal cluster on the bark of the tree in the autumn. The young ones, when first hatched, are of a red color, and their food is plant lice and other small insects, and when they can find nothing else, they destroy each other. As they grow larger, they shed their skin, and their food is then large caterpillars, or indeed any insect they can overpower. A dozen of these insects, if placed near one of the web nests of the caterpillar so destructive to fruit and shade trees, will destroy almost every caterpillar in it, as each one is able to kill and devour several daily. Care must be taken, however, when handling old insects, as they are apt to sting, and the poison from their puncture being extremely strong, is much more painful and dangerous than the sting of a large hornet or wasp. *Evagorus rubidus*, a medium-sized, red and black heteropterus insect, preys also upon other insects, and has been found busily employed feeding upon the orange plant louse in Florida. Several species of *Pentatoma*, *Nabis*, *Pyrates*, &c., feed also upon insects, and no doubt destroy a great many of our insect foes. Some of the water bugs feed upon larvæ of mosquitos which frequent the same water.

The order *Homoptera*, comprising the cicada, tettigonia, (improperly termed thrips,) plant louse and scale insects, are almost all very injurious to vegetation by living upon the juice of growing plants.

Among the *Diptera*, or two-winged insects, many are very useful in destroying or removing putrid animal and vegetable substances; others pass their larva state in the bodies of other insects, and like ichneumon flies, kill great numbers of them, while some, when in the perfect or fly state, feed entirely upon insects, which they pierce with their proboscis to suck their juices. *Midas filatus*, or the orange branded midas, a large black fly, having a broad orange band across the abdomen, destroys other insects; the larvæ, however, feed upon decayed wood.

The family of *Asiliidæ*, in the fly state, feed upon insects. *Asilus sericeus*, a large brownish species, was captured in the spring while flying, feeding upon a humble-bee much larger than itself, which it had killed and was carrying about with it in its mouth or on the end of its proboscis. The curious appearance it presented while thus engaged first attracted attention, and led to its capture; indeed nothing is more common in spring and early summer than to see the female of *Dasypogon*, *Asilux*, and *Erax* flying from place to place with some large fly which they have captured in order to suck its juice. Doubtless in this way they destroy many noxious insects. The *tachina* and *sarcophaga*, medium sized flies, which resemble the common house fly in color and general appearance, but are much larger, are as beneficial as the ichneumon flies before mentioned, in destroying caterpillars. The eggs, one to three, or more, are deposited upon the first three segments of the body of the caterpillar, near the head, and where it is impossible for the persecuted worm to get rid of them by biting or pulling them off with its jaws. These eggs are glued to the caterpillar, so that when dry they cannot be removed without tearing the skin. They may frequently be seen upon the grub of the tobacco moth, in the shape of small whitish grains on the first segments. It is useless to try to raise any caterpillar on which these eggs have been deposited, as the larvæ when hatched penetrate into the body of the worm, eventually killing it. When they leave it (through holes bored in its skin), they go into the ground; the outer skin contracts and hardens into a brown oval case, inside of which the pupa is formed. These flies not only attack the tobacco worm, but almost every other caterpillar; they have been found in great numbers on the grass or army worm. *Tachina vivida*, a very bristly, large, brownish fly, destroys the caterpillars of *Dryocampa* (*Eacles*) *imperialis*, or imperial moth, which feeds upon oak, pine, plane, and other trees. An *Anthrax* has been bred from the chrysalis of a moth. The *Syrphici*, small, active, wasp-like, two-winged flies, generally of a dark color, banded with bright yellow, and which may be seen any summer day hovering like humming birds over flowers, are exceedingly beneficial, as the female deposits her egg near the much dreaded plant lice, where they soon hatch into footless grubs, which immediately begin to feed upon the lice, destroying multitudes of them. When the larvæ has completed its growth, it fixes itself to a leaf, and changes to the pupa state. The perfect fly, when ready to emerge, forces itself out of the thicker end of the pupa case, which is egg-shaped. The larvæ of a species of *Baccha* are very useful in Florida, as they destroy the orange plant lice. A species of *Toxophora*, belonging to the *Bombyliarii*, was produced from the clay case or round, pot-shaped nest of *Eumenes fraterna*, or potter wasp, found adhering to the branch of a small shrub. It had evidently devoured the rightful possessor.

Many other insects beneficial to the farmer might be mentioned, but as those have been enumerated which are the best known and most useful, and as this article is intended for the instruction of farmers and young entomologists, and not for the scientific naturalist, it will be unnecessary to expatiate more on this subject. Sufficient, however, has been said to prove that the study of the natural habits and instincts of insects is of the greatest consequence to the farmer, in order to know which are friends and which are enemies. Without the aid of these small predaceous and parasitic allies, noxious insects would increase to such an extent as to render all labor unavailing, for all noxious insects, with very few exceptions, are destroyed by some other insects, either as food for themselves or their young. Thus it is, while there are multitudes of noxious insects destroying our crops, there are at the same time useful ones appointed by a special providence to diminish their numbers—to check their too rapid increase; and while the farmer sees only the damage done by those that are injurious, he never observes those which, unappreciated and unseen, are silently engaged in the work of their destruction.

TOWNSEND GLOVER.

From Agricultural Reports.

REPORT OF THE CHEMIST.

SIR: I have the honor herewith to submit a report of operations in the chemical labratory of the department since the date of my appointment as chemist. These labors have been limited to a period of six months, and embrace analyses of various kinds made on the application of parties scattered through a majority of the States of the Union. The materials submitted for analysis may be classified under three heads:

1. Soils and natural manures.
2. Produce of soil and educts therefrom.
3. Mineral and metallurgic analyses.

Besides the foregoing, the labratory has been engaged with analyses for other departments of the public service.

Soil analyses.—Under the class of soils, very many analyses have been made for agriculturists, and chiefly for those interested in the cultivation of the grape. The majority of the samples of soil forwarded for analysis are in quantities too small, and do not appear to have been selected with that care necessary to secure a trustworthy analysis upon which the farmer might safely predict the success of his mode of cultivation. In selecting soils for analysis, five or six spadefuls should be taken from different parts of the field, and, after being spread out in a thin layer for several days to dry, should be put twice, at least, through a fine sieve to insure uniform mixture. If a complete analysis be required, not less than two pounds should be sent; for a partial analysis, three or four ounces will be sufficient. If the soils of different parts of a given field vary much in character, equal amounts from each of the kinds should be mixed together before being sifted.

Very many of the inquiries made of the department show that some (and not a small portion) of the farming community have no clear idea of the value of an analysis of the soil. For example, a farmer sends for analysis a sample of soil which, he states, poisons his crop, and desires to know what the poison is and how to correct it. He gives no information of the crop poisoned, his rotation, nor the position and physical quality of his ground. An analysis of the soil failed to detect any ingredient noxious to plants generally, or in excessive quantity, but showed from the debris of rush and marsh plants that it was cold and waterlogged. Chemistry cannot help ground in such condition; and the farmer would do well to remember that the chemical constitution of the soil is only one of the three principal considerations in cultivation—the others being the wants of the crops proposed to be grown, and the nature and composition of the manures designed for such crops.

The physical properties of a soil are, perhaps, of more importance to the consideration of the farmer than the chemical constitution. The latter he can control and ameliorate by manure so as to make it suitable for most crops, of which the abundant use of common farm manure on every land is a patent example; but the physical properties of land oppose at every step the efforts of the agriculturist to grow certain classes of plants on soils not physically favorable to their life.

The physical qualities of soil are exerted upon the atmosphere above it, and upon the subterranean water-currents below it; and in proportion as it draws most largely upon these is a soil, generally speaking, most productive. Thus a soil of good physical texture and porosity may excel in value soils which are richer in chemical constituents. Hence, the analysis of a soil to determine its chemical ingredients is of little value if considered as in itself the means of determining the worth or the wants of the land; and, if so considered, without due regard to its physical condition, the needs of the crops, and the manure at command, it will inevitably result in disappointment, and bring chemical science into unmerited disrepute.

Natural manures.—Of natural manures a few have been examined, consisting of peat and shell marl. Samples of peat and muck have also been forwarded with requests for analyses and directions concerning their use. These have been complied with, but particulars are of no public benefit.

Products of soil.—Under this head are placed plants grown for food or technical uses, such as grapes, sorghum, beet, and other sugar-yielding plants, with examination of their educts, as wines and brandies from native juices fermented.

Grapes and wine.—A sample of grapes from a wild grape of the locality, cultivated by Mr. F. B. Fancher, Albany, New York, was received for examination as to its quality as a wine producer. The grapes were red, medium sized, plump, and thin-skinned. They were placed under the press immediately upon arrival, and upon examination yielded: Amount of juice, 65 per cent.; specific gravity of filtered juice, not neutralized, 1.084; dry grape sugar, by Fehling's test, 7.66 per cent.; acid, neutralized, calculated as dry tartaric, 8.05 per cent.; cream of tartar present, 1.146 per cent. The grape is deficient in sugar, which cultivation might increase. The comparison of this grape with other varieties may be obtained by reference to the report of the department for the year 1862, p. 570 *et seq.*

A sample of wine from a native grape, forwarded by Mr. Heald, of Pepperell, Massachusetts, yielded the following results: Specific gravity, 1.007; tartaric acid per oz., 0.38 grain; sugar, trace; free acid, 3.3 per cent.; extract, 2.4 per cent.; spirit, 9.6 per cent. This wine contains less than the usual quantity of tartaric acid, and an unusual amount of acetic acid, and is much too sour for ordinary use. It was not received in good condition, acetic fermentation having set in by reason of the bad sealing of the bottle. Too little care is bestowed upon the mannerof forwarding samples of grape-juice and wine to this department for examination. By not carefully excluding the external air, the liquid becomes spoiled while in transitu. Mr. Heald calls the grape of this wine the Fox grape, but this term is hardly specific enough, as in various localities different varieties of vine receive this title. No information of the exact grape yielding the juice sent from Albany, examined as above, could be obtained. The chief value of such analyses reverts to the individual, and is of little public good.

Before agriculture can hope to attain a rational amount of assistance from chemical science, there must exist the closest possible union of the field and the labra tory. It is not sufficient to know merely what amount of mineral elements is contained in a root or a grain crop, and whether the soil contains such total quantities, to answer the question whether that crop can be grown profitably on that soil. As regards the plant, it is necessary to know, in addition, at what period of growth any or all these elements are taken up from the soil; and on the part of the soil it is requisite to know whether it can eliminate the quantity needed at the time required. Many soils contain every mineral element which a crop requires, but are so slow in decomposition that the crop fails for want of the supply at the right time. Now, to ascertain these wants, and the time when they are felt, experiments on the growing plants should be made almost weekly; and thus a constant communion of work between the chemist and the agriculturist is called for, in order to work out a complete solution of the questions arising in the history of the growth of any of our food crops. This has already been attempted by Prof. Anderson, in connection with the Highland Agricultural Society of Scotland, upon two of the most common crops—turnips and potatoes; and though his experiments are neither wholly exhaustive nor of conclusive value here, yet, as examples of the road which chemistry and agriculture must travel together for mutual benefit, they are invaluable, and stand as models for future work. The opportunities which this department enjoys, in the possession of a garden and farm, which may be placed in connection with the labratory, particularly favor this line of investigation; and arrangements have been made, in conformity with the foregoing expression of views, to ascertain he ratable growth and mineral appropriation of some of our most common crops, at different and progressive stages of their growth. Analyses of crops made in Europe are uncertain guides on this continent, and serve only for general results. Before we have exact knowledge of the wants of our crops, it will be necessary to make, beforehand, a series of analyses similar to those alluded to above; for, inasmuch as the climate of Europe and mode of cultivation differ from those on this continent, so will the proximate principles, in relative amount, differ even in the same species cultivated in both places. The influences of season and climate in developing one set of principles, and of delaying the appearance of another, have been as yet but little studied in our country. It is proposed, during the coming summer, to make a series of analyses on a few of our growing crops, in order to ascertain and determine some of the physiological conditions in the life of these plants; and as the sugar interest is one of great importance in the United States, preparations have been made, by the selection of pure French seed for planting on the farm of the department, to examine the growth of the sugar beet, in reference to the appearance to the sugar in the juice, so as to be able to determine its ratable increase, and the point of growth at which the amount is highest. It is proposed to apply the same mode of analysis to growing sorghum; and thus, having soil, manure, and cultivation of these two valuable sugar-yielding plants under observation and control, it is confidently hoped that some results valuable to American agriculture will be obtained.

Sugar plants.—The lateness of the season when I entered on duty prevented any experiments on the fresh plants. During the early spring, some experiments upon an improved mode of clarifying sorghum juice and syrups were carried out in the labratory by Mr. William Clough, of Cincinnati, the able editor of the *Sorgo Journal.* The improvement consists in the use of metallic salts, of high specific gravity, which, in their passage through the hot and neutralized liquor, carried downward, by their mechanical effects, all impurities, and in a few minutes produced a clear and fine looking syrup. The insolubility of the preparation used as the clarifier serves as the protection to the sugar liquid, so that no poisonous or unpleasant impregnation can occur. Mr. Clough's experiments were satisfactory and successful.

A portion of the sorghum grown in the garden during the past summer, after having been cut in August, was stacked on the ends, stripped of the outer loose leaves, and left in this condition out of doors in the early winter. In the months of December, 1866, and January following, several of these stalks were examined in the laboratory, with a view to ascertain what change had been effected by the exposure to the air, and the occasional night frosts of the late fall. The general result was that the juice had a higher specific gravity, and a larger percentage of sugar, than were yielded by the living cane. The stems examined on January 23d yielded: Total sugar in cane juice, 20.00; cane sugar, 11.10; glucose, 8.90; specific gravity of juice, 1.069. The density of the juice and the total amount of sugar yielded are much higher than that of the fresh sap; the effect of the stacking in air is to evaporate a portion of the water of the sap, leaving a relatively stronger juice. This juice obtained in January may, with advantage, be compared with the juice obtained from the fresh stalks, immediately after being cut, on September 27, 1866. The determinations were made by Dr. J. R. Hayes, then the assistant in the laboratory, upon new varieties sown in the garden, and marked Nos. III and IV. No. III. specific gravity of juice, 1.083; uncrystallizable sugar, 4.38 per cent.; cane sugar, 7.86 per cent.; total sugar in juice, 12.24 per cent. No. IV. specific gravity of juice, 1.075; uncrystallizable sugar, 3.60 per cent.; cane sugar, 5.94 per cent.; total sugar in juice, 9.54 per cent. Contrasting the amount of sugar in the fresh and dry cane, the latter greatly preponderates; and were the question only on the amount of sugar to be obtained, the decision would be in favor of working on the partially dried canes; but on observing the ratio of glucose and cane sugar in the fresh juice and that expressed later, it will be remarked that the relative amount of glucose is much higher, so that the sugar appears to be gradually passing into glucose the longer it remains in the cane, showing that the fermenting causes are as active within the stem of the drying cane as after the juice has been expressed and exposed to the air. Several attempts were made in the laboratory to granulate the sugar of this juice, but whether neutralized and defecated or not, the invariable result was the disappearance of cane sugar, and a uniform syrup of uncrystallizable sugar. Thus far, then, laboratory examinations indicate the necessity of evaporating the juice of the recently cut canes, if it is desired to obtain any crystallizable sugar. The dark coloring matters appear also to adhere more closely to the sugar in the juice of dry canes.

It is obvious to every one connected with agriculture that, since the farming community has in practice determined upon the extended cultivation of sugar-yielding plants, there can be no doubt of the duty resting upon the department, and the advantage to be gained by its efforts, to aid the producers in the advancement of their object by affording whatever assistance lies within the power of science. Considering the wide extent of our country, there never can be in true agriculture any clashing of interests as to what plant is fittest to be grown for yielding sugar. The variety of the climate and the necessities of the cultivator forbid the country to depend on one plant alone. Where the cane ceases to grow, the sorghum and the beet can enter into the rotation, and even these two cannot be considered competitors. The beet produces chiefly cane sugar, and crystallizable sugar can be readily obtained from it. Its refuse, while of no high value as a foodmaterial for cattle, is eminently valuable as a manure. The sorghum, while it contains some cane sugar in its early juice, loses it as it advances in life, and in all cases, by the usual methods of defecation and clarification, its existing sugar is almost wholly converted into uncrystallizable sugar; so that, for syrup-making alone the sorghum may be superior, it is inferior to the beet as fresh food or fodder for cattle, or as a plant from which sugar can be readily obtained. Considering the universal consumption of sugar by the population of this country—at a rate approaching twenty-five pounds per year for each individual—the rapid augmentation of our numbers, and our dependence upon foreign countries for the greater portion of the supply of this necessary article of diet, the attention of the agricultural community might profitably be directed toward the culture and growth of those plants which not only yield sugar, but are otherwise so useful for fodder and fresh food, and for manure. The statesman acknowledges the propriety of raising crops for our own consumption when the balance of trade is against us, and every consumer desires the home production, if thereby the article be cheaper. After a few decades have passed, the amount of sugar required to be imported for our own use will be enormous. At present we supply only one-third of the demand, leaving nearly 350,000 tons of sugar to be supplied from foreign sources—an amount which in every future year will need to be increased. Thus the necessity for the more extended cultivation of sugar plants is incontestable.

There are but two of these at present known to the civilized world which can, by processes of manufacture, steadily and profitably yield crystallizable sugar. These are the sugar cane and the beet. There are few countries so favored by their extent as to be able to cultivate both plants. The sorghum and maple, as sources of sugar, may be placed out of view, inasmuch as the supply of sugar from both is limited, and the separation of the sugar is not a remunerative process. In all our northern and northwestern States we have the climate, soil, and other favorable conditions, for securing a large yield from the sugar-beet; and to the farmer, whether raised for its sugar, or for its fattening qualities for stock, or for its manure yield, it is one of the most valuable of the crops which are embraced in its rotation. The raising of beets for sugar is not, like that of sorghum, an experiment on which opinion is divided. Half a century of growth in France has made it the sugar plant of that country. It has extended into Germany, Prussia, and Poland, and would long since have been the source of the sugar crop in England did not her colonial policy forbid its manufacture. The processes and machinery are brought to a high perfection, and the manufacture of beet sugar is now carried on with the same exactness and economy as that pursued in a cotton mill or other factory. If we add to this the fact that even a slight chemical experience in the matter justifies the assertion that beets raised under an American summer are relatively more saccharine than those grown in Europe, there is certainly a sufficient stimulus to cultivation, and insured security against experimental loss, to justify the American farmers, north of Mason and Dixon's line, in planting large breadths of land in this beet, and in forming manufactories in the vicinity to work them up.

Seeds of the most approved varieties of French and German beet having been imported by the department, a series of experiments on their growth and relative value will be carried out this summer, the results of which will be communicated in a subsequent report.

Setting aside the value of the sugar beet, there are some results of observations made in the laboratory, which appear to indicate that the common varieties of beet will, under proper cultivation, yield a large share of sugar juice—larger, in fact, than is usually supposed. In this respect, the "long yellow turnip beet" yielded a considerable excess over the "Englefield orange globe" and the "Carter orange globe." Thus, of the two varieties cultivated in the garden, under similar conditions, the quantity of juice yielded and residue left were very different. Sixty-eight ounces of each, crushed and pressed, yielded—

Long yellow turnip, 12 ounces of juice, and 56 ounces of residue.

Englefield orange globe, 7½ ounces of juice, and 60½ ounces of residue.

The juice itself varied in the most marked manner.

	Long yellow turnip beet.	Englefield orange globe beet.
Specific gravity of juice	1.040	1.018
Percentage of water	79.84	94.36
Watery extractive and ash	9.26	2.70
Acid, chiefly oxalic	.94	.76
Cane sugar	7.31	2.05

Although these beets were of large size, and therefore did not yield a percentage of sugar equal to younger roots, yet the quantity obtained from the long yellow turnip was unusually large. While it is not advantageous to have very large roots for sugar extraction, there is also no economy in the use of very small ones, on account of the increased labor in the necessary cleansing processes, though they are relatively richer in sugar. In order to obtain the greatest amount of sugar, the root should be pushed on rapidly in growth, and be retained in the ground the shortest time possible. A plentiful supply of water in the early summer favors this very much. If the growth of the beet be delayed till late summer, a portion of the cane sugar is liable to be lost by conversion into glucose and lactic acid within the plant. Strong manures, yielding ammonia, appear to favor this change. As the beet family are potash-loving plants, the manure should be chiefly farm manure, in moderate quantity, with plenty of wood ashes, as these develop the growth of leaves with rapidity, and increase the quantity of sap in the young plants. The results of Corewinder's experiments on the sugar beet, cultivated near Lille, France, show that the addition of guano to the plants diminishes the amount of sugar in the juice. It would appear as if the introduction of ammoniacal salts into the body of the root favors rapid oxidation, and thereby destroys the cane sugar. The natural acids of the beet are malic and oxalic, the latter being predominant; and as this acid is the result of partial oxidation (or of deoxidation) within the vegetable, its presence might be made to serve as an index to the conditions of the plant favorable to the preservation of cane sugar, and its quantity might be increased by judicious additions of manure containing potash.

An experiment carried out at the Beet-root Sugar Company's farm at Chatsworth, Illinois, during the past year, obtained an average of crystallizable sugar in the juice equal to 7½ per cent.; this falling to 5½ per cent. upon refining. So rich a product for the first year is very encouraging, as the result was obtained on the ordinary soil, unmanured, but rich in native fertility. The beets were not crushed immediately upon being raised, owing to the want of machinery; but it is asserted that a loss of but one per cent. of sugar was the result of four months' delay in expressing the juice. Should this account be verified by further experiment, the value of the beet would rise in comparison with sorghum, since it does not appear possible, from results given in this report, to obtain crystallizable sugar from partially dry canes without considerable loss.

MINERAL AND METALLURGIC ANALYSIS.

Under this class are placed samples of minerals used in the arts and manufactures, and the ores of the common and noble metals, as iron, lead, copper, zinc, tin, manganese, silver, and gold.

Samples of paint-earths, as substitutes for oil-colors, and suitable for out-door work, pipe clays, fuller's earth, pottery clays, and similar minerals, have been forwarded to this office by farmers and others, from whose ground they were taken. These have been uniformly examined and reported upon. Numerous samples of gold and silver ores and other metalliferous minerals have been forwarded for examination and report, as well from agriculturists as from private parties not owning the lands from which they come, all requiring a minute and full chemical assay to determine their exact value. A few of these have been acted upon; but it would be very desirable if this last variety of analysis were omitted in the laboratory, as it requires special arrangements not otherwise necessary in an agricultural laboratory, and also has no claim upon the attention of the department, having no bearing upon agricultural progress. Moreover, it occupies a vast deal of the time which otherwise would be more appropriately devoted to the special art for the advancement of which this department was founded. The propriety of any department of the Government authorizing work to be done for the benefit of private enterprise is questionable, and as there are at all times abundant sources of employment for chemical science in connection with agriculture, a few of which are alluded to in this report, the work in the laboratory should be confined within its proper sphere of limitation. Respectfully,

THOMAS ANTISELL, M. D.

Hon. ISAAC NEWTON, *Commissioner.*

PREMIUM LIST ADOPTED BY THE STATE BOARD OF AGRICULTURE FOR STATE FAIR—FALL OF 1868.

FRUIT—AMATEUR'S LIST.

Rules—The Awarding Committee will report a list of the varieties in each collection, to which they award premiums. All fruits must be grown by the exhibitor, and correctly labelled, (four of each variety,) accompanied by a list of the same for each entry, and one full statement as to the kind of soil, exposure, any new features in the art of cultivation, which have been attended with success. No collection can compete for more than one premium; that is to say, there must be a separate collection for each entry, except sweepstakes, in the same class. No premium shall be awarded to inferior specimens or collections, it being the object not to encourage the exhibition of inferior sorts, having reference to the excellence and value of varieties only.

Nurserymen will not be allowed to compete in this section.

APPLES.

Best 25 varieties of apples	$15
Best 20 varieties of apples	10
Best 12 varieties of apples	8
Best 6 varieties of apples	4
Best 15 varieties of winter apples	10
Best 5 varieties of fall apples	5

PEARS.

Best 15 varieties of pears in succession	15
Best 10 varieties of pears in succession	10
Best 5 varieties of pears in succession	5

PEACHES.

Best display of peaches, of not less than 5 varieties	10

PLUMS.

Best display of plums, of not less than 5 varieties	10

GRAPES GROWN IN OPEN AIR.

Best 5 varieties of grapes	5
Second best do	2
Best 3 varieties of grapes	3
Second best do	1
Best 5 clusters of grapes, any kind	3
Best collection of grapes—diploma and	10
Best collection of grapes, grown under glass, of not less than 5 varieties	10

QUINCES.

Best dozen quinces	$2

PROFESSIONAL OR NURSERYMEN'S LIST.

(Requisites the same as Amateur's List.)

APPLES.

Best 25 varieties of apples—diploma and	15
Best 20 varieties of apples—diploma and	10
Best 12 varieties of apples—diploma and	8
Best 6 varieties of apples—diploma and	4
Best 15 varieties of winter apples—diploma and	10
Best 5 varieties of fall apples—diploma and	5

PEARS.

Best 15 varieties of pears in succession—diploma and	10
Best ten varieties of autumn pears—diploma and	10
Best 5 varieties of winter pears—diploma and	5

PEACHES.

Best display of peaches, not less than 5 varieties	10

PLUMS.

Best display of plums, not less than 5 varieties—diploma and	5

NATIVE GRAPES.

Best collection of grapes—diploma and	10
Best 5 varieties of grapes—diploma and	5
Best 3 varieties of grapes—diploma and	3
Best 1 variety of grapes—diploma and	2

QUINCES.

Best dozen quinces—diploma and	2

THE STAR (*) LIST.

This will be a highly interesting feature of the exhibition, to all genuine promologists and those of *educated* taste, as well as those who wish to become posted in regard to the most profitable fruit to be grown for market, especially the apple, which is destined soon to become one of the staple articles of commerce in Indiana. Persons wishing to compete for these premiums, who are not members of the State Horticultural Society, and who, consequently, have no copy of the transactions to guide them, as well as all others wishing to be informed of the *promological status* of our State, can obtain a copy and become members of the Society by sending one dollar to I. D. G. Nelson, President, at Fort Wayne; Seth W. Pearson, Recording Secretary, at Plainfield; or Joseph Gilbert, Corresponding Secretary at Terre Haute.

Best 5 varieties of winter apples most profitable for commercial purposes in Northern Indiana	$5
Best 5 fall and 10 winter varieties for family use and for market in Northern Indiana	15
Best 5 varieties of winter apples most profitable for commercial purposes in Central Indiana	5
Best 5 fall and 10 winter varieties for family use and for market in Central Indiana	15
Best 5 varieties of winter apples most profitable for commercial purposes in Southern Indiana	5
Best 5 fall and 10 winter varieties for family use and for market in Southern Indiana	15
Best display of apples for the State at large	20
Best display of pears do	15
Best display of grapes do	10

Exhibitors in this class will be required to confine their lists to such varieties as have received the commendation of the State Horticultural Society. No fruit can be exhibited for mere show, under the penalty of the exhibitor being ruled out; the object being to test the progress of *promological science* in our State, under the auspices of the Indiana State Horticultural Society—therefore, the awards will be made purely on the intrinsic merits of the fruit, as defined by and published in the transactions of that Society.

SPECIAL PREMIUMS.

Best display of fruits of all kinds from any County, District, or Local Horticultural Society	30
Second best do	10

WINE.

Best display of wine made in Indiana	15
Second best do	10

Wine competing for premiums are made from pure, unadulterated juice of the grape, otherwise, the Committee to make no award.

For best display of wine made in the United States	diploma.

FLOWERS—AMATEUR'S LIST.

Nurserymen and dealers in green house plants, cannot compete in this class.

Best collection of green house plants, not including plants for bedding out	15
Second best do	10
Best collection of dahlias	5
Second best do	2
Best collection of bedding out plants in bloom, verbenas, petunias, phloxes, etc	8
Second best do	4

Best basket fresh cut flowers	$3
Second best do	2
Best boquet, round	3
Second best do	2
Best boquet, flat	3
Second best do.	2

FLOWERS—PROFESSIONAL'S LIST.

Exclusively for nurserymen and dealers in green house plants.

Best collection of green house plants, not including plants for bedding out—diploma and	10
Best 25 varieties of dahlias—diploma and	5
Best collection of bedding out plants in bloom—diploma and	5
Best basket fresh cut flowers	3
Best basket fresh cut roses	3
Best boquet, round	3
Best boquet, flat	3
Best boquet, mantle	3
Best collection winter parlor blooming plants—diploma and	5
Best collection camelias	5
Best collection varigated-leaved plants	5
Best arrangement of plants for exhibition, including quality of plants and taste in arranging the same—diploma and	15
Best aquarium and fixtures	5
Best fountain and water-jet in operation in floral hall—diploma and	20

MISCELLANEOUS.

JELLIES, PRESERVES, PICKLES, AND CANNED FRUITS.

No article can be entered to compete for more than one premium, except as part of a "collection" in the same class.

Best collection jellies, made by exhibitor	$5
Second best do.	3
Best collection preserves	5
Second best do.	3
Best collection fruit butter	5
Second best do.	3
Best collection pickles, made by exhibitor	5
Second best do.	3
Best collection dried fruit	3
Best collection canned fruit, made by one exhibitor	10
Second best do.	5
Best collection jellies, preserves, butter, pickles, and canned fruit, by one exhibitor	15
Second best do.	5

Duplicate statements must be furnished showing the process followed in the manufacture of the articles in this class. The judges will test the articles, and make a full written report of the result of their investigation.

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